TM 11-5820-401-10-1

Operator's Manual

EQUIPMENT DESCRIPTION

OPERATOR'S CONTROLS

PMCS

OPERATION

TROUBLE SHOOTING

RADIO SETS

AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (NSN 5820-00-223-7415),
AN/VRC-44 (NSN 5820-00-223-7417), AN/VRC-45 (NSN 5820-00-223-7418),
AN/VRC-46 (NSN 5820-00-223-7433), AN/VRC-47 (NSN 5820-00-223-7434),
AN/VRC-48 (NSN 5820-00-223-7435), AND
AN/VRC-49 (NSN 5820-00-223-7437)
(USED WITHOUT INTERCOM SYSTEMS)

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1981

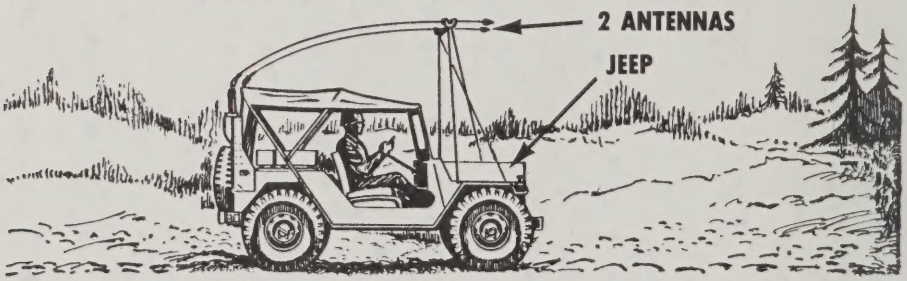
WARNING

SERIOUS INJURY OR EVEN DEATH CAN HAPPEN IF THE FOLLOWING ARE NOT CAREFULLY OBSERVED WHEN INSTALLING AND USING THE ANTENNAS USED WITH YOUR RADIO SETS.

BEFORE ANY MISSION FIND OUT

1. ARE THERE ANY POWERLINES IN YOUR AREA OF OPERATION?
2. HOW HIGH ARE THESE POWERLINES?
3. HOW TALL ARE THE POLES OR TOWERS CARRYING POWERLINES?

MOBILE OPERATION WITH WHIP ANTENNAS

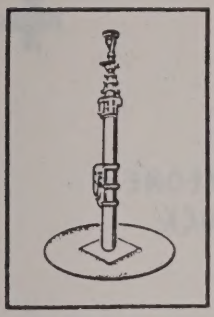


DO NOT STOP YOUR VEHICLE UNDER POWERLINES

- IF POSSIBLE, TRY TO MAINTAIN MOBILE COMMUNICATIONS WITH YOUR ANTENNA(S) TIED DOWN.
- MAKE SURE AN ANTENNA TIP CAP IS SECURELY TAPED ON THE END OF ANY WHIP ANTENNA HAVING TWO OR THREE ANTENNA ELEMENTS.
- DO NOT LEAN AGAINST OR TOUCH ANY ANTENNA WHILE THE TRANSMITTER IS ON.
- DURING CROSS-COUNTRY OPERATION, DO NOT ALLOW ANYONE TO STICK AN ARM, LEG OR WEAPON OVER THE SIDES OF THE VEHICLE. IF YOUR ANTENNA ACCIDENTALLY TOUCHES A POWERLINE AND A LEG, ARM OR WEAPON CONTACTS A DAMP BUSH OR THE GROUND, A SERIOUS OR FATAL ACCIDENT CAN HAPPEN.
- IF YOU ARE NOT SURE THAT AN ANTENNA ON YOUR VEHICLE WILL CLEAR A POWERLINE, STOP BEFORE YOU GET CLOSE TO THE POWERLINE AND EITHER CAREFULLY TIE DOWN THE ANTENNA OR REMOVE ANTENNA SECTIONS TO MAKE SURE THAT YOU CAN SAFELY DRIVE UNDER THE POWERLINE.

FIXED OPERATION WITH LONG RANGE ANTENNAS

WARNING



TELESCOPING ANTENNA MAST

EXTENDED RANGE ANTENNA

NEVER ERECT THESE LONG RANGE ANTENNAS DIRECTLY UNDER POWERLINES.

IF YOU MUST ERECT THESE LONG RANGE ANTENNAS NEAR POWERLINES, POWERLINE POLES OR TOWERS, OR BUILDINGS WITH OVERHEAD POWERLINE CONNECTIONS. NEVER PUT THE ANTENNA CLOSER THAN TWO TIMES THE ANTENNA HEIGHT FROM THE BASE OF THE POWERLINE, POLE, TOWER OR BUILDINGS.

NEVER ATTEMPT TO ERECT ANY LONG RANGE ANTENNA WITHOUT A FULL TEAM.

BEFORE ERECTING ANY LONG RANGE ANTENNA, INSPECT ALL THE PARTS MAKING UP THE ANTENNA KIT. DO NOT ERECT THE ANTENNA IF ANY PARTS ARE MISSING OR DAMAGED.

DO AS MUCH OF THE ASSEMBLY WORK AS POSSIBLE ON THE GROUND.

WHEN ERECTING THE ANTENNA, ALLOW ONLY TEAM PERSONNEL IN THE ERECTION AREA.

MAKE SURE THAT THE AREA FOR THE ANCHORS IS FIRM. IF THE GROUND IS MARSHY OR SANDY, GET SPECIFIC INSTRUCTIONS FROM YOUR CREW CHIEF OR SUPERVISOR ON HOW TO REINFORCE THE ANCHORS.

WHEN SELECTING LOCATIONS FOR ANCHORS, AVOID TRAVELED AREAS AND ROADS. IF YOU CANNOT AVOID THESE AREAS, GET SPECIFIC INSTRUCTIONS FROM YOUR SUPERVISOR AS TO WHAT CLEARANCE YOUR GUY WIRES AND ROPES MUST HAVE OVER THE TRAVELED AREAS AND ROAD.

CLEARLY MARK ALL GUY WIRES AND ROPES WITH THE WARNING FLAGS OR SIGNS SUPPLIED BY YOUR UNIT. IN AN EMERGENCY, USE STRIPS OF WHITE CLOTH AS WARNING STREAMERS.

IF YOU SUSPECT THAT POWERLINES HAVE MADE ACCIDENTAL CONTACT WITH YOUR ANTENNA, STOP OPERATING, ROPE OFF THE ANTENNA AREA, AND NOTIFY YOUR SUPERIORS.

IF THE WEATHER IN YOUR AREA CAN CAUSE ICE TO FORM ON YOUR LONG RANGE ANTENNA AND ITS GUY WIRES AND ROPES, ADD EXTRA BUYS TO SUPPORT THE SYSTEM. ROPE OFF THE AREA AND POST IT WITH WARNING SIGNS LIKE "BEWARE OF FALLING ICE."

DO NOT TRY TO ERECT ANY ANTENNA DURING AN ELECTRICAL STORM.

KEEP A SHARP EYE ON YOUR ANCHORS AND GUYS. CHECK THEM DAILY AND IMMEDIATELY BEFORE AND AFTER BAD WEATHER.

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

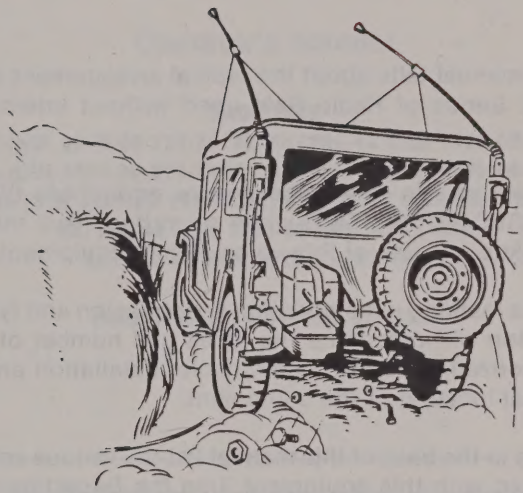
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER

3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4. SEND FOR HELP AS SOON AS POSSIBLE

5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING



BEFORE YOU MOVE YOUR VEHICLE, CHECK YOUR ANTENNA TIEDOWNS AND MAKE SURE THAT:

1. ANTENNAS DO NOT CROSS EACH OTHER.
2. AN ANTENNA TIP CAP IS SECURELY TAPED IN PLACE.
3. ANTENNAS DO NOT STICK OUT BEYOND THE SIDES OF THE VEHICLE.
4. ALL TIEDOWN ROPES ARE TIED TO A PLACE APPROVED BY YOUR COMMANDER. DO NOT TIE THE TIEDOWN ROPES TO JUST ANY PLACE.
5. THE TIEDOWNS ARE ADJUSTED TO PREVENT THE ANTENNAS FROM HITTING ANY PEDESTRIAN IN THE FACE.

HOW TO USE THIS MANUAL

- This technical manual tells about the typical arrangement and use of the AN/VRC-12 Series of Radio Sets used without intercom equipment.
- You may be required to use voice secure equipment (VINSON or NESTOR COMSEC EQUIPMENT) while operating. This manual also covers the hookup and use of this voice secure equipment.
- While using this manual, remember that your mission and type of vehicle or installation will determine the types and number of audio accessories authorized, antennas used, cable installation and routing, and the physical location of the equipment.
- The appendixes in the back of this manual list the various components that can be used with this equipment. Use the Department of Army Supply Bulletins to identify the various harnesses, installation kits and accessory kits authorized for your installation.
- As an aid while you are inventorying or transferring your equipment, use a copy of the proper hand receipt in HAND RECEIPT Technical Manual 11-5820-401-10-1-HR.

TECHNICAL MANUAL
No. 11-5820-401-10-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC 12 FEBRUARY 1981

Operator's Manual

RADIO SETS
AN/VRC-12 (NSN 5820-00-223-7412), AN/VRC-43 (NSN 5820-00-223-7415), AN/VRC-44 (NSN 5820-00-223-7417), AN/VRC-45 (NSN 5820-00-223-7418), AN/VRC-46 (NSN 5820-00-223-7433), AN/VRC-47 (NSN 5820-223-7434), AN/VRC-48 (NSN 5820-00-223-7435), AND AN/VRC-49 (NSN 5820-00-223-7437)

(USED WITHOUT INTERCOM SYSTEMS)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications and Electronics Materiel Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, New Jersey 07703.

In either case, a reply will be furnished direct to you.

*This manual supersedes TM 121-5820-401-10-1, 30 August 1977, including all changes.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL INFORMATION

1-1. SCOPE

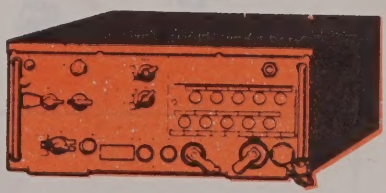
- The purpose of this manual is to tell you how to operate and maintain the AN/VRC-12 Series of Radio Sets that are used without intercom systems.

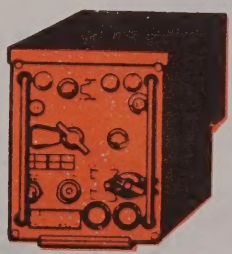
- The AN/VRC-12 Series of Radio Sets make up many radio systems used in vehicles, including Jeeps, trucks, and personnel carriers. They are also used in light aircraft, helicopters, marine craft, communications shelters and vans.

- Your operating procedures will be affected by the voice secure equipment (VINSON or NESTOR COMSEC equipment) connected to your radios.

- TM 11-5820-401-10-2 covers the AN/VRC-12 Series of Radio Sets used with intercom systems.

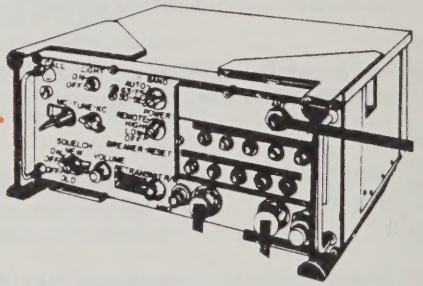
- A Hand Receipt Technical Manual, TM 11-5820-401-10-1-HR, is available. It contains preprinted DA Forms 2062 (Hand Receipt/Annex No.) for radio sets components and associated installation kits for radios in tracked vehicles, thus identifying the parts listed in appendix C with a particular radio configuration and vehicle. This hand receipt manual is published to aid property accountability. The hand receipt manual title is given in appendix A under TM 11-5820-401-10-1-HR.



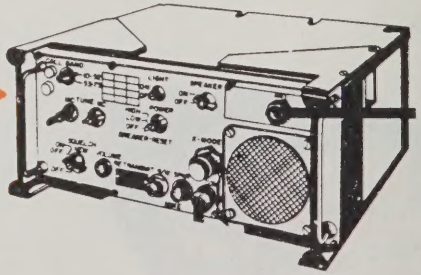


1-2. NOMENCLATURE CROSS REFERENCE

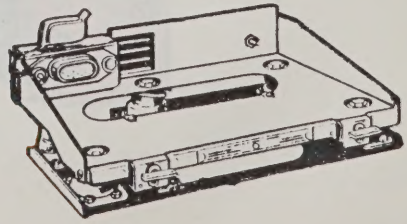
Common Name	Official Nomenclature and General Application
AN/VRC-12 SERIES of radio sets	Radio Sets AN/VRC-12, AN/VRC-43 through 49.
PUSHBUTTON RECEIVER-TRANSMITTER or R-T	Receiver-Transmitter RT-246(*)/VRC used with AN/VRC-12, AN/VRC-43, AN/VRC-44 and AN/VRC-45.



R-T or RECEIVER-TRANSMITTER WITH SPEAKER	Receiver-Transmitter RT-524(*)/VRC used with AN/VRC-46, AN/VRC-47, AN/VRC-48 and AN/VRC-49. Has a built-in loudspeaker in place of the push-buttons.

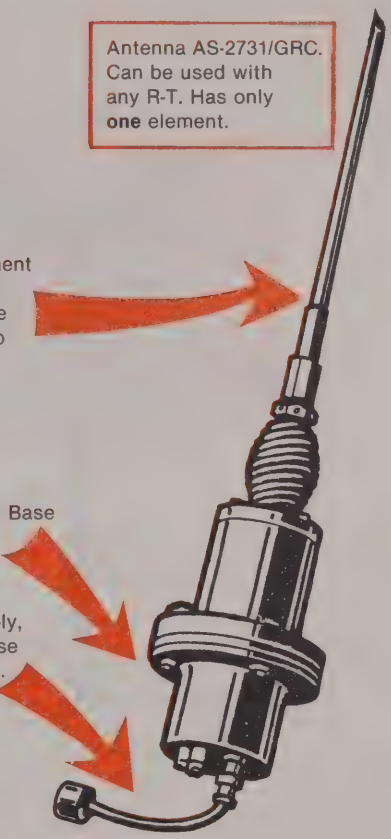


R-T MOUNT	Mount MT-1029/VRC. Used with any R-T in the AN/VRC-12 SERIES.



1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
COMPACT ANTENNA	Antenna AS-2731/GRC. Can be used with any R-T. Has only **one** element.
COMPACT ANTENNA ELEMENT	Antenna Element AS-2732/GRC. Does **NOT** use an antenna tip cap.
COMPACT ANTENNA MATCHING UNIT	Matching Unit Base MX-9146/GRC.
COMPACT ANTENNA ADPATER CABLE	Cable Assembly, Special Purpose CX-13055/GRC.



CAUTION

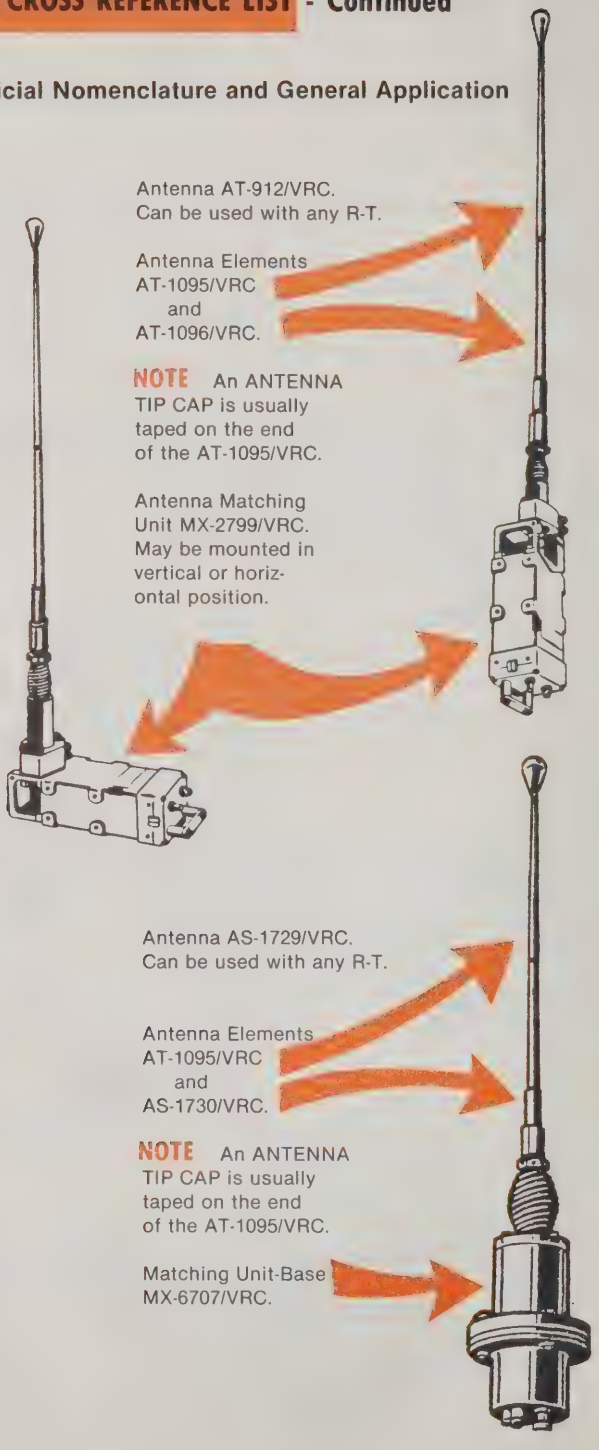
ONE OF THREE DIFFERENT VEHICULAR ANTENNAS MAY BE USED WITH YOUR R-T.

DO NOT TRY TO SWAP ANTENNA MATCHING UNITS.

DO NOT TRY TO SUBSTITUTE THE BOTTOM ANTENNA ELEMENT FROM ONE TYPE OF ANTENNA FOR THE BOTTOM ELEMENT OF ANOTHER TYPE.

1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
BOX BASE ANTENNA	Antenna AT-912/VRC. Can be used with any R-T.
BOX BASE ANTENNA ELEMENTS	Antenna Elements AT-1095/VRC and AT-1096/VRC.
	NOTE An ANTENNA TIP CAP is usually taped on the end of the AT-1095/VRC.
BOX BASE ANTENNA MATCHING UNIT	Antenna Matching Unit MX-2799/VRC. May be mounted in vertical or horizontal position.
ROUND BASE ANTENNA	Antenna AS-1729/VRC. Can be used with any R-T.
ROUND BASE ANTENNA ELEMENTS	Antenna Elements AT-1095/VRC and AS-1730/VRC.
	NOTE An ANTENNA TIP CAP is usually taped on the end of the AT-1095/VRC.
ROUND BASE ANTENNA MATCHING UNIT	Matching Unit-Base MX-6707/VRC.



1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
WHIP ANTENNA	Tiedown assembly.
ANTENNA TIP CAP	Tip cap element.

CAUTION

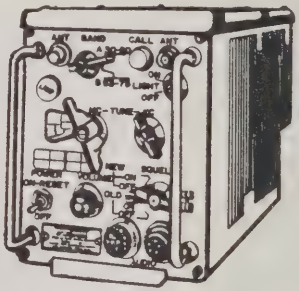
ANY VEHICULAR WHIP ANTENNA THAT HAS 2 or 3 ELEMENTS
SHOULD HAVE
AN ANTENNA TIP CAP AND ANTENN TIEDOWN ASSEMBLY

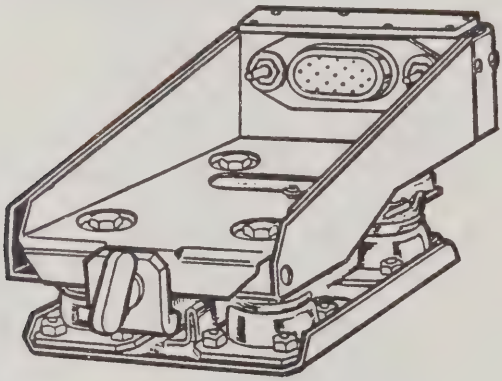
EXTENDED RANGE ANTENNA	Antenna Equipment RC-292 or OE-2541/GRC. Can be used with any R-T to get more range.

TELESCOPING ANTENNA MAST	Mast AB-903/G. Used to raise the COMPACT ANTENNA (AS-2731/GRC) OR the ROUND BASE ANTENNA (AS-1729/VRC high above the ground.

1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
AUX RECEIVER	Receiver, Radio R-442(*)/VRC. Used with AN/VRC-12, AN/VRC-44, AN/VRC-47 and AN/VRC-48.
AUX RECEIVER MOUNT	Mount MT-1898/VRC. Used with the AUX RECEIVER.
AUX RECEIVER ANTENNA	Mast Base AB-15/GR with 3 antenna elements.
AUX RECEIVER ANTENNA ELEMENTS	Antenna Elements MS-116A, MS-117A and MS-118A.

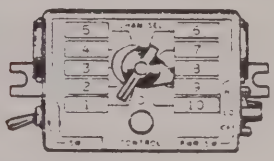


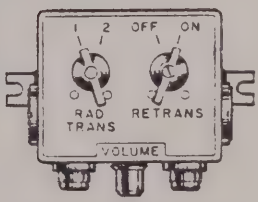


NOTE The AUX RECEIVER ANTENNA uses 3 elements. It also needs an ANTENNA TIP CAP and a WHIP ANTENNA TIEDOWN.

1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
REMOTE CONTROL BOX	Control, Radio Set C-2742/VRC. Used for remote control of the PUSHBUTTON R-T (RT-246(*)/VRC).
RADIO RELAY BOX	Control, Radio Set C-2299/VRC. Used for automatic radio relay with Radio Sets AN/VRC-45 and AN/VRC-49. It is also made available with other AN/VRC-12 series of radio sets to allow convenient connections of the audio accessories to an R-T.





1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application	
MICROPHONE	Microphone, Dynamic M-80/U	
EARPHONE HEADSET	Headset H-140/U or H-251.	
COMBINATION HEADSET	Headset, Microphone H-161/U.	
HANDSET	Handset H-189/GR or H-250.	
LOUDSPEAKER	Loudspeaker LS-454/U.	

NOTE

The above audio accessories may be connected in many ways to your radio equipment. Specific instructions for connecting and using these audio accessories will be found in the OPERATION UNDER USUAL CONDITIONS section.

1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
VINSON COMSEC EQUIPMENT	TSEC/KY-57 voice secure equipment. Includes Power Supply HYP-57/TSEC and Mount MT-4626/VRC. This is the latest voice-secure equipment in the field.
VINSON R-T MOUNT	The standard R-T MOUNT (MT-1029/VRC) which has been modified to work with the VINSON COMSEC equipment. Modification includes the addition of Interconnecting Box J-3513/U to the R-T MOUNT.
VINSON AUX RECEIVER MOUNT	The standard AUX RECEIVER MOUNT (MT-1898/VRC) which has been modified to work with the VINSON COMSEC equipment. Modification includes the addition of Interconnecting Box J-3514/U to the AUX RECEIVER MOUNT.
VINSON RELAY BOX	Control, Retransmission C-10734/VRC. When VINSON COMSEC equipment is involved in a radio relay (retransmission) hookup of the AN/VRC-45 or AN/VRC-49, the VINSON RELAY BOX is used in place of the standard RADIO RELAY BOX (C-2299/VRC).
VINSON SWITCH BOX	Switch, Audio Frequency, SA-2171/VRC. Used when one VINSON COMSEC equipment is to be switched between an R-T and an AUX RECEIVER.
NESTOR COMSEC EQUIPMENT	TSEC/KY-38 voice secure equipment. An early model of voice-secure equipment.

1-2. NOMENCLATURE CROSS REFERENCE LIST - Continued

Common Name	Official Nomenclature and General Application
Authorized RADIO INSTALLATION KIT	Includes cables, mounts (example = R-T MOUNT), control boxes (example = RADIO RELAY BOX), and other needed items. All items in the authorized RADIO INSTALLATION KIT are removed from the vehicle before the vehicle is turned in.
Authorized RADIO INSTALLATION ACCESSORY KIT (it was called COMBINATION KIT)	Includes all the cables and accessories and other items needed when another radio is to be installed in the vehicle. All items in the authorized INSTALLATION ACCESSORY KIT are removed from the vehicle before the vehicle is turned in.
Authorized COMSEC INSTALLATION KIT	Includes cables and hardware need to install VINSON or NESTOR COMSEC equipment in a vehicle. Al items in the authorized COMSEC INSTALLATION KIT are removed from the vehicle before the vehicle is turned in.

1-3. GLOSSARY

CIPHER mode	- Secure (scrambled) communications using VINSON or NESTOR COMSEC EQUIPMENT.
configuration	- The arrangement of parts or components.
cryptovariables	- The classified electronics information fed into VINSON or NESTOR COMSEC equipment to give you secure communications (CIPHER MODE).
NESTOR	- Early models of COMSEC EQUIPMENT.
RADIO WIRE INTEGRATION	- Interconnecting radios and telephone signals.
sidetone	- The sound of your voice in your headset or loudspeaker.
VINSON	- The latest model of COMSEC EQUIPMENT.

1-4. LIST OF ABBREVIATIONS AND SYMBOLS

ac	alternating current
am.	amplitude modulation
CEOI	Communication Electronics Operation Instructions
C-E ORG MAINT	Communications-Electronics Organizational Maintenance
dc	direct current
Hz	Hertz
kHz (was KC)	kiloHertz
MHz (was MC)	megaHertz
rf	radio frequency
RWI	radio wire integration
X-MODE	Voice secure or digital radio communications.
(*)	This symbol means all models of the equipment.

1-5. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. **Reports of Maintenance and Unsatisfactory Equipment.** Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (Army). Air Force personnel will use AFM 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting.

b. **Report of Item and Packaging Discrepancies.** Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVSUPINST 4440.127E/AFR 400.54/MCO 4430.E.

c. **Discrepancy in Shipment Report (DISREP) (SF 361).** Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33B/AFR 75-18/MCO P4610.19C and DLAR 4500.15.

1-6. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Refer to TM 750-244-2 for proper procedures for destruction of this equipment to prevent enemy use.

1-7. PREPARATION FOR STORAGE OR SHIPMENT

The storage and shipment of these radios must be carefully done. Complete instructions will be found in chapter 3 in this manual.

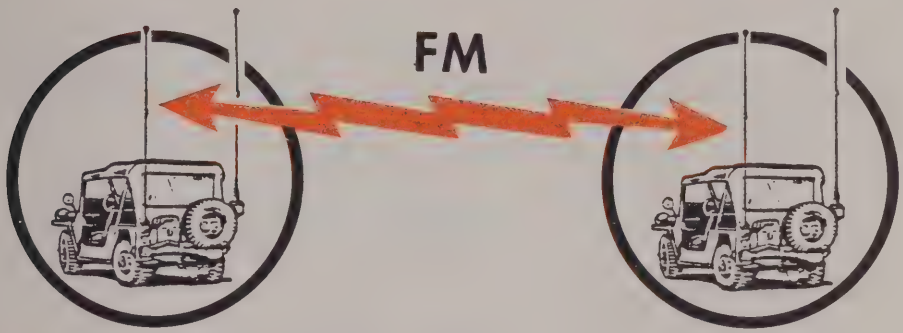
1-8. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your AN/VRC-12 series needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Tell us why a procedure is hard to peform. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications and Electronics Material Readiness Command, ATTN: DRSEL-ME-MQ, Fort Monmouth, New Jersey 07703. We'll send you a reply.

Section II. EQUIPMENT DESCRIPTION

1-9. PURPOSE, CAPABILITIES AND FEATURES OF AN/VRC-12 SERIES OF RADIO SETS

Used to provide short range, two-way radio voice communications between vehicles.



- Frequency modulation (fm) type of radio sets.
- Transmit and receive in the frequency range of 30 mHz to 75.95 mHz.
- Range and type of operation may require different antennas.
- Components of this series of radio sets can be hooked up to make up radio relay sets or remote controlled radio sets or RWI.
- When authorized, secure voice communications or digital data transmission can be provided (X-MODE).
- This series includes Radio Sets:

  AN/VRC-12
  AN/VRC-43
  AN/VRC-44
  AN/VRC-45
  AN/VRC-46
  AN/VRC-47
  AN/VRC-48
  AN/VRC-49

- The AN/VRC-46 and AN/VRC-49 are most common in the RWI, remote control and retransmission hookups, BUT, the other sets can be used.

1-10. PERFORMANCE DATA FOR THE AN/VRC-12 SERIES OF RADIO SETS

- TRANSMISSION DISTANCE WITH WHIP ANTENNA.
  LOW POWER: Approximately 5 miles (8 kilometers (km)).
  HIGH POWER: Approximately 25 miles (41 km).

- TRANSMITTER POWER OUTPUT.
  LOW POWER: Approximately 0.5 to 8 watts.
  HIGH POWER: 35 watts minimum.

- OPERATING POWER.
  From the 24-volt vehicle battery system.
  22 to 30 volts dc is the common range of voltages in 24-volt vehicle battery systems.

- FREQUENCY RANGE FOR ALL R-T's AND ALL AUX RECEIVERS.
  30 megaHertz (MHz) to 75.95 MHz in 2 bands.

- TYPE OF MODULATION.
  All R-T's and AUX receivers use frequency modulation (fm).

- TYPE OF OPERATION.
  Push to talk and release to listen.

- MODES OF OPERATION.
  Voice (radiotelephone).
  Retransmission (radio relay).
  X-mode (secure voice or digital data).

1-10. PERFORMANCE DATA FOR THE AN/VRC-12 SERIES OF RADIO SETS - Continued

- TUNING AUX RECEIVERS.
  All AUX receivers are manually tuned by using knobs.

- TUNING RT-524(*)/VRC.
  This R-T is manually tuned by using knobs.

- TUNING PUSHBUTTON RT-246(*)/VRC.
  Can be manually tuned by using knobs.

  OR

  Has 10 pushbuttons which you can preset and then select any one of the 10 preset frequencies by pressing the correct pushbutton.

  AND

  Can be remotely tuned to any of the 10 preset frequencies from a remote position by using the REMOTE CONTROL BOX.

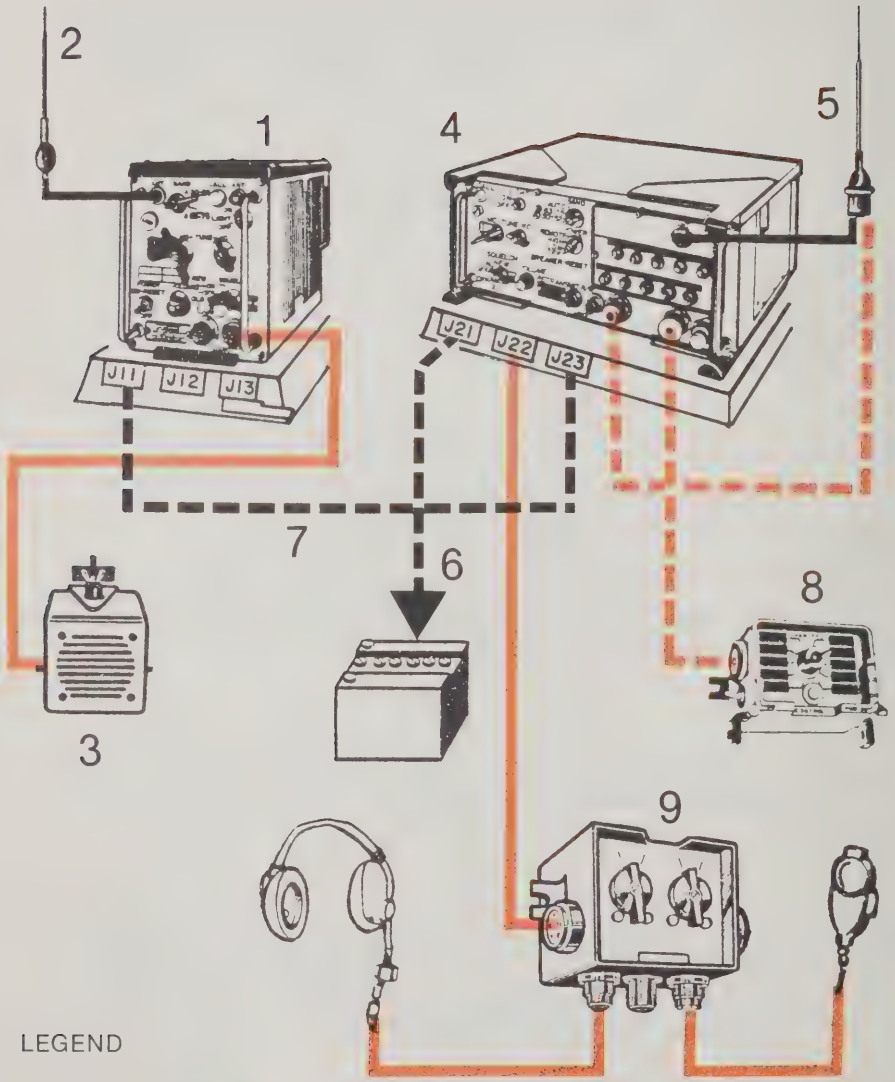
- TUNING CIRCUITS IN BASE OF BOX BASE ANTENNA.
  Automatically done when you tune the R-T.

- TUNING CIRCUITS IN BASE OF COMPACT ANTENNA OR ROUND BASE ANTENNA.
  Automatically done when you tune the R-T if you have a cable connected from the ANT CONT receptacle on the R-T to the antenna base.

  BUT

  If no cable is used, you must manually tune the antenna by using the 10 position switch located on the underside of the antenna base.

1-11. THIS IS A TYPICAL



RADIO SET AN/VRC-12

1 AUX RECEIVER WITH ITS MOUNT.
Underside of mount contains receptacles J11, J12, and J13.

2 AUX RECEIVER ANTENNA.

3 AUX RECEIVER LOUDSPEAKER.
Loudspeaker has short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

4 PUSHBUTTON R-T WITH ITS MOUNT.
Underside of mount contains receptacles J21, J22, and J23.

5 PUSHBUTTON R-T ANTENNA.
One cable feeds rf signals to and from the PUSHBUTTON R-T.
Other cable controls the circuits in the antenna matching unit.

6 POWER CABLE.
Gets power from the vehicle's battery for the radio system.

7 POWER TRANSFER CABLE.
Connects the AUX RECEIVER to the PUSHBUTTON R-T for power.

8 REMOTE CONTROL BOX.
Permits changing to any one of the 10 preset frequencies of the PUSHBUTTON R-T without using the pushbuttons.

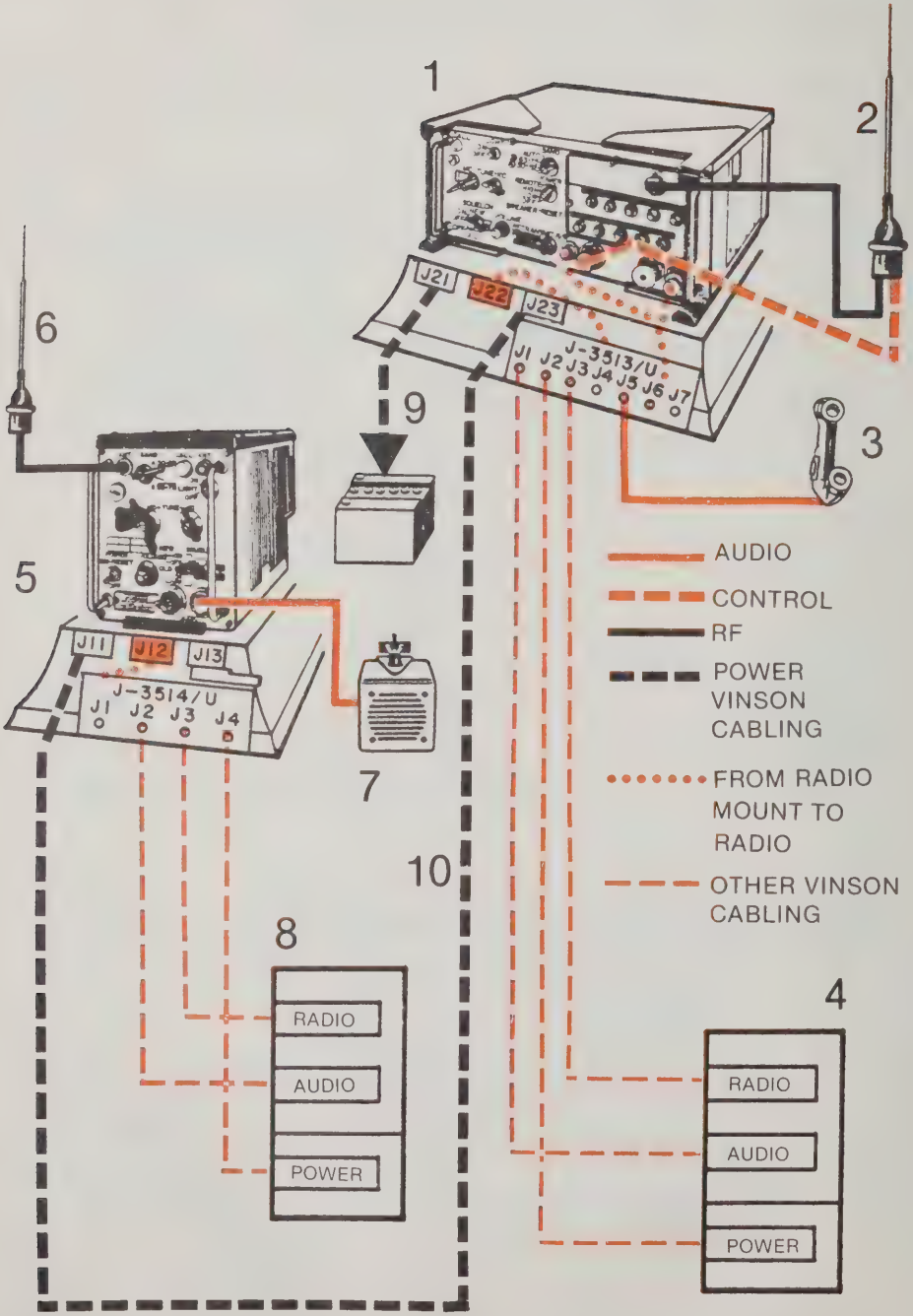
9 RADIO RELAY BOX.
The RADIO RELAY BOX is being used as convenience box to connect the audio accessories.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 CAN BE USED WITH THE AN/VRC-12.
2. R-T OPERATES ON ONE FREQUENCY AND AUX RECEIVER OPERATES ON ANOTHER FREQUENCY.
3. ONLY NESTOR COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-12.

THIS IS A TYPICAL



RADIO SET AN/VRC-12

1 PUSHBUTTON R-T ON VINSON R-T MOUNT.
Mount has wired-in Interconnecting Box J3513/U.

2 ANTENNA FOR THE PUSHBUTTON R-T.
One cable feeds rf signals to and from the R-T. Other cable controls the circuits in the antenna base.

3 HANDSET.
Used for both clear and secure communications.

4 VINSON COMSEC EQUIPMENT FOR THE R-T.

5 AUX RECEIVER ON VINSON AUX RECEIVER MOUNT.
Mount has wired-in Interconnecting Box J3514/U.

6 AUX RECEIVER ANTENNA.

7 AUX RECEIVER LOUDSPEAKER.

8 VINSON COMSEC EQUIPMENT FOR AUX RECEIVER.

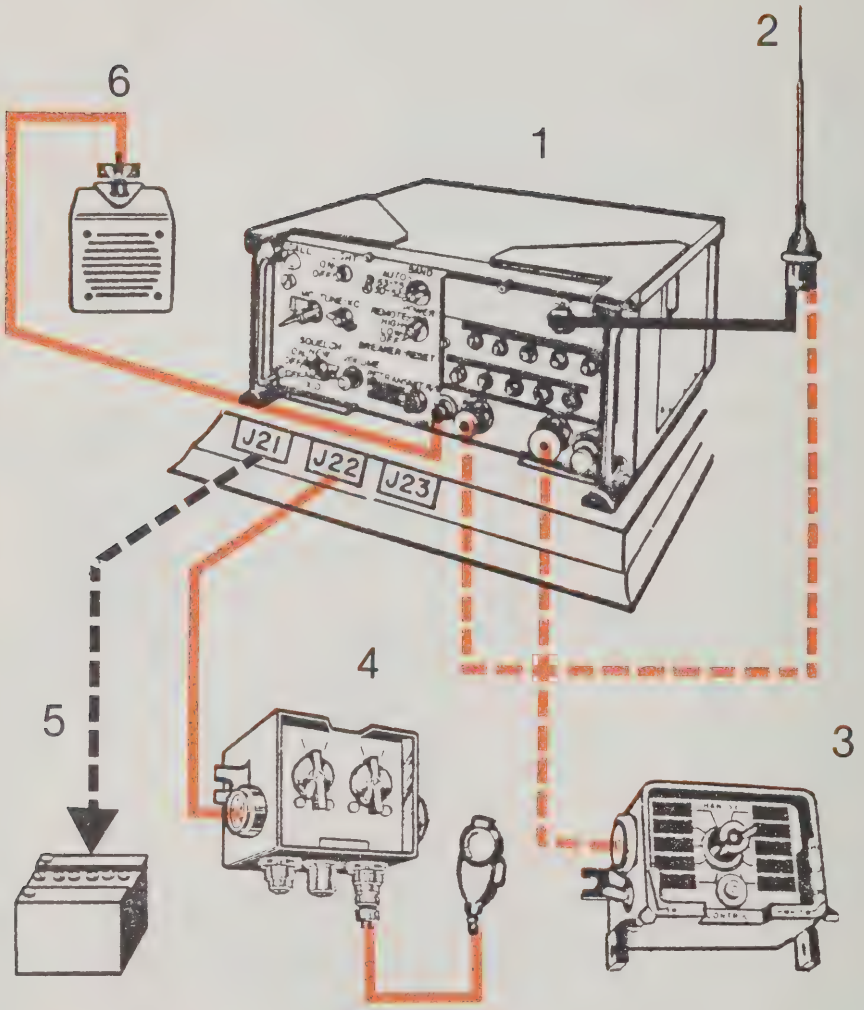
9 POWER CABLE.
Gets power from the vehicle's battery for the electronic equipment.

10 POWER TRANSFER CABLE.
Connects the AUX RECEIVER to the R-T for power.

NOTES

1. ONLY VINSON COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.
2. R-T OPERATES ON ONE FREQUENCY AND THE AUX RECEIVER ON ANOTHER FREQUENCY.

1-13. THIS IS A TYPICAL



RADIO SET AN/VRC-43

1 PUSHBUTTON R-T WITH ITS MOUNT.
Underside of mount contains receptacles J21, J22, and J23.

2 PUSHBUTTON R-T ANTENNA.
One cable feeds rf signals to and from the PUSHBUTTON R-T.
Other cable controls the circuits in the antenna matching unit.

3 REMOTE CONTROL BOX.
Permits changing to any one of the 10 preset frequencies of the PUSHBUTTON R-T

4 RADIO RELAY BOX.
The RADIO RELAY BOX is being used as a convenience box to connect the audio accessories.

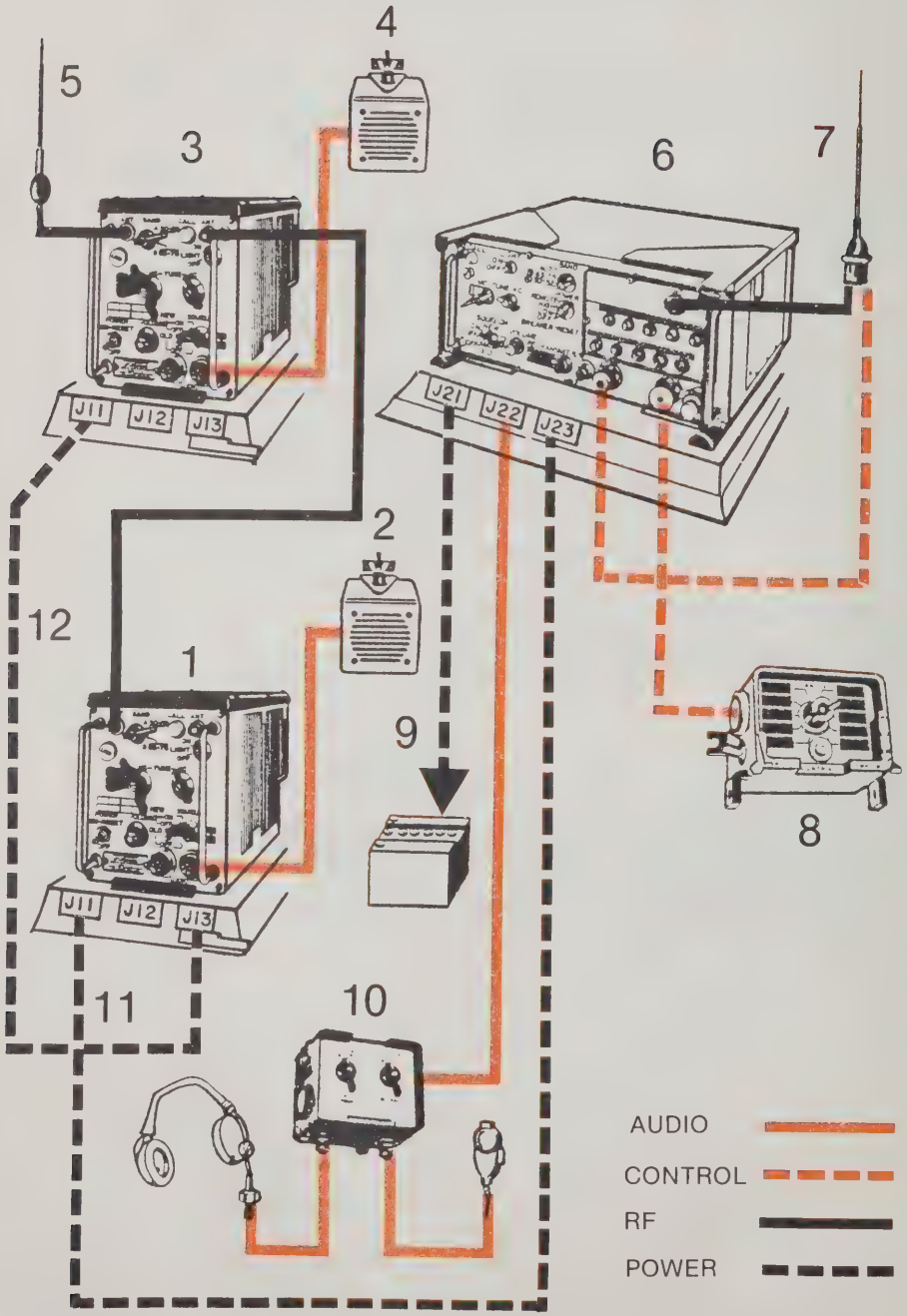
5 POWER CABLE.
Gets power from the vehicle's battery for the radio system.

6 PUSHBUTTON R-T LOUDSPEAKER.
Loudspeaker has a short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 CAN BE USED.
2. ONLY NESTOR COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-14. THIS IS A TYPICAL



RADIO SET AN/VRC-44

1 AUX RECEIVER NO. 1 WITH ITS MOUNT.
Underside of mount contains receptacles J11, J12 and J13.

2 LOUDSPEAKER FOR AUX RECEIVER NO. 1.
Loudspeaker has a short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

3 AUX RECEIVER NO. 2 WITH ITS MOUNT.

4 LOUDSPEAKER FOR AUX RECEIVER NO. 2.

5 ANTENNA FOR BOTH AUX RECEIVERS.
One cable connects the antenna to AUX receiver No. 2.
Another cable connects the antenna from AUX receiver No. 2 to AUX receiver No. 1.

6 PUSHBUTTON R-T WITH ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

7 PUSHBUTTON R-T ANTENNA.
One cable feeds rf signals to and from the R-T. Other cable controls circuits in the antenna base.

8 REMOTE CONTROL BOX.
Permits changing to any one of the 10 preset frequencies without using the pushbuttons.

9 POWER CABLE.
Gets power from the vehicle's battery for the radio system.

10 RADIO RELAY BOX.
The RADIO RELAY BOX is being used as a convenience box to connect the audio accessories.

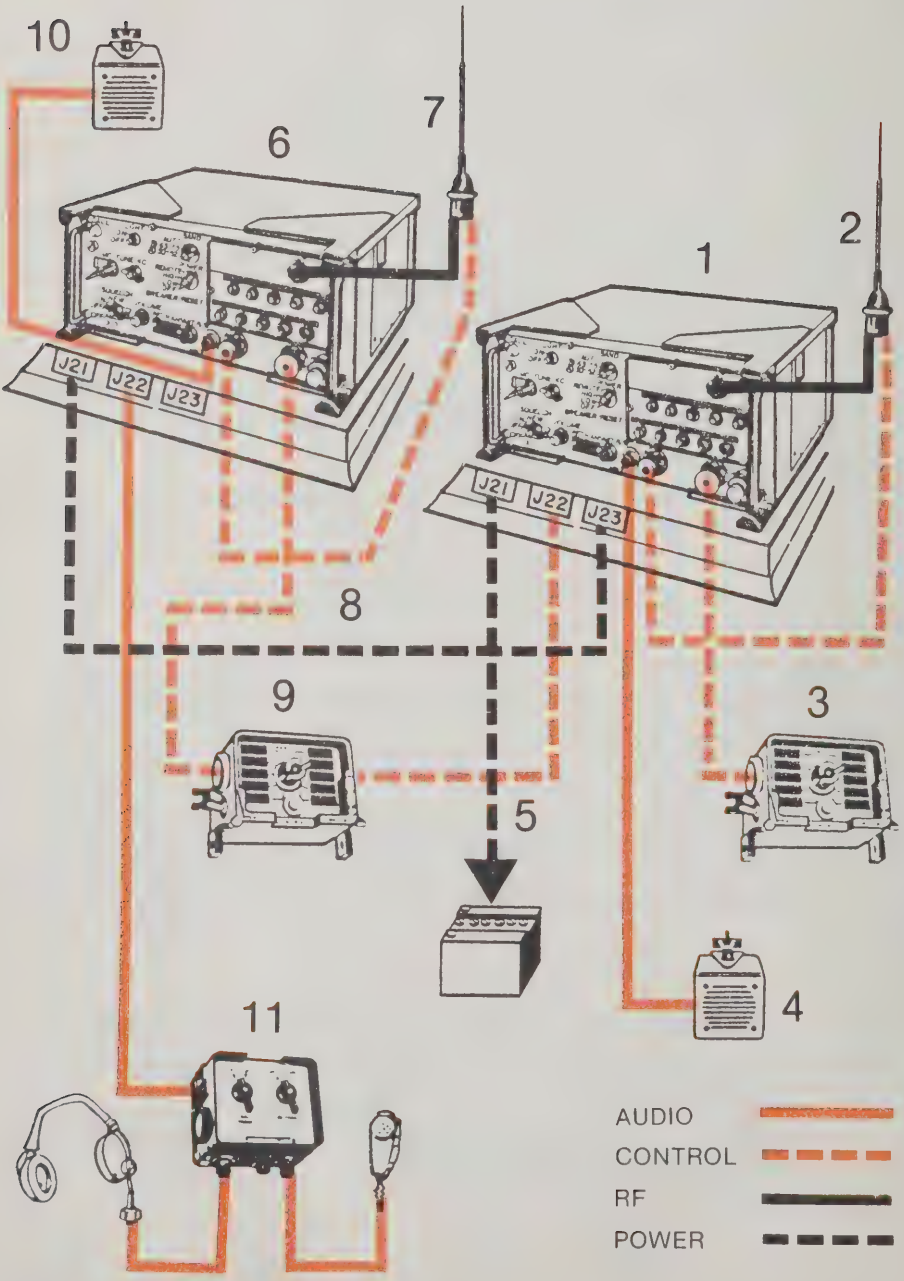
11 POWER TRANSFER CABLE TO AUX RECEIVER NO. 1.

12 POWER TRANSFER CABLE TO AUX RECEIVER NO. 2.

NOTES

1. ONLY NESTOR COMSEC EQUIPMENT CAN BEUSED WITH THIS HOOKUP.
2. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.
3. PUSHBUTTON R-T OPERATES ON A FREQUENCY AND EACH AUX RECEIVER OPERATES ON A DIFFERENT FREQUENCY.

1-15. THIS IS A TYPICAL



RADIO SET AN/VRC-45

1 PUSHBUTTON R-T NO. 1 WITH ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

2 ANTENNA FOR PUSHBUTTON R-T NO. 1.
One cable feeds rf signals to and from the PUSHBUTTON R-T.
Other cable controls circuits in the antenna base.

3 REMOTE CONTROL BOX.
Permits changing to any one of the 10 present frequencies without using the pushbuttons.

4 LOUDSPEAKER FOR PUSHBUTTON R-T NO. 1.
Loudspeaker has a short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

5 POWER CABLE.
Gets power from the vehicle's battery for the radio system.

6 PUSHBUTTON R-T NO. 2 WITH ITS MOUNT.

7 ANTENNA FOR PUSHBUTTON R-T NO. 2.

8 POWER TRANSFER CABLE TO PUSHBUTTON R-T NO. 2.

9 REMOTE CONTROL BOX.

10 LOUDSPEAKER FOR PUSHBUTTON R-T NO. 2.

11 RADIO RELAY BOX.
The RADIO RELAY BOX is being used in its normal way for radio relay operation and audio accessory connection.

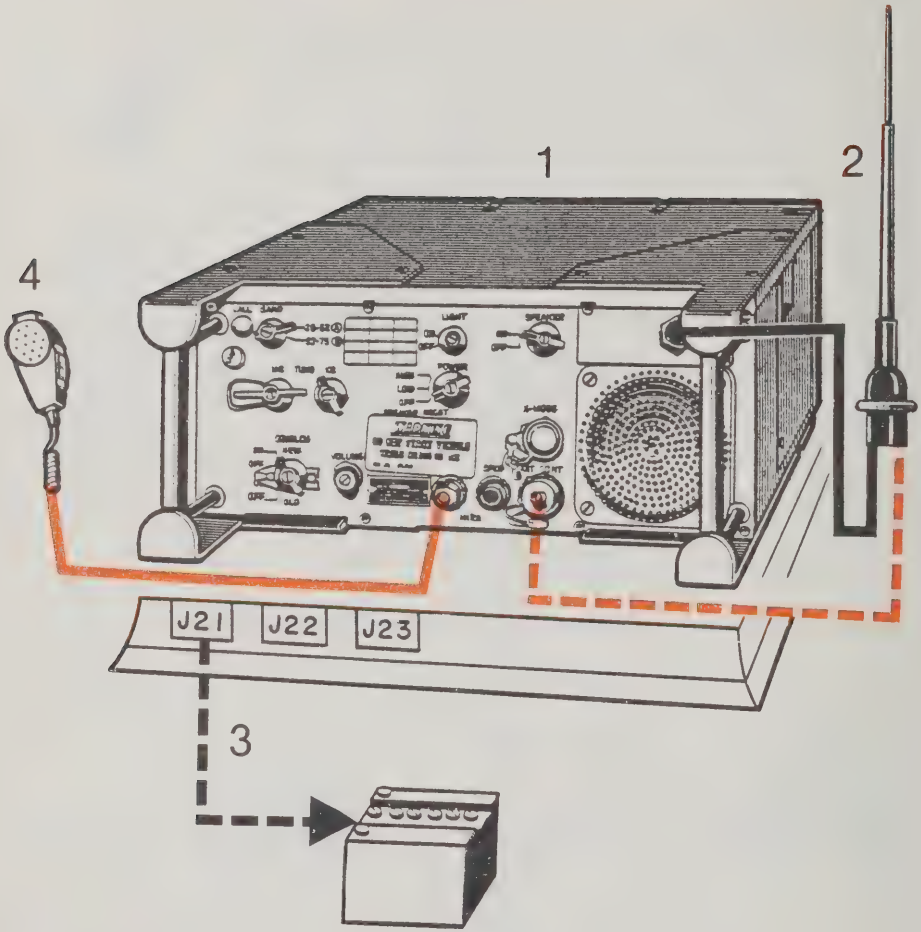
NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.

2. EACH PUSHBUTTON R-T OPERATES ON A DIFFERENT FREQUENCY, PROVIDES RETRANSMISSION (RADIO RELAY) CAPABILITY.

3. ONLY NESTOR COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-16. THIS IS A TYPICAL



AUDIO
CONTROL
RF
POWER

RADIO SET AN/VRC-46

1 R-T WITH SPEAKER ON ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

2 ANTENNA FOR R-T WITH SPEAKER.
One cable feeds rf signals to and from the R-T WITH SPEAKER, other cable controls circuits in the antenna base.

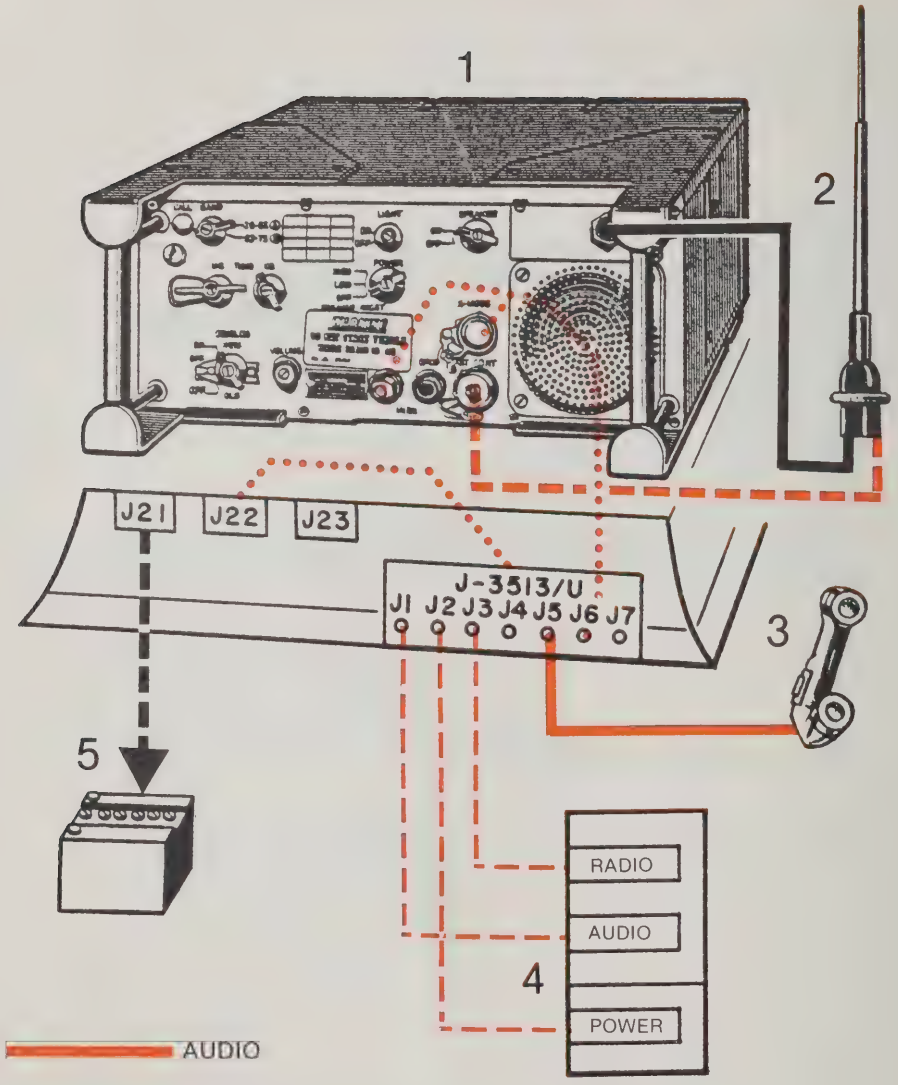
3 POWER CABLE.
Gets power from the vehicle's battery for the radio.

4 MICROPHONE.
Can be connected to either the SPEAKER or RETRANSMIT R/W receptacles on the R-T.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.
2. ONLY KESTOH COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-17. THIS IS A TYPICAL



RADIO SET AN/VRC-46

1 R-T WITH SPEAKER ON VINSON R-T MOUNT.
Mount has wired-in Interconnecting Box J-3513/U.

2 ANTENNA OR R-T WITH SPEAKER.
One cable feeds rf signals to and from the R-T.
Other cable controls the circuits in the antenna base.

3 HANDSET.
Used for both clear and secure communications.

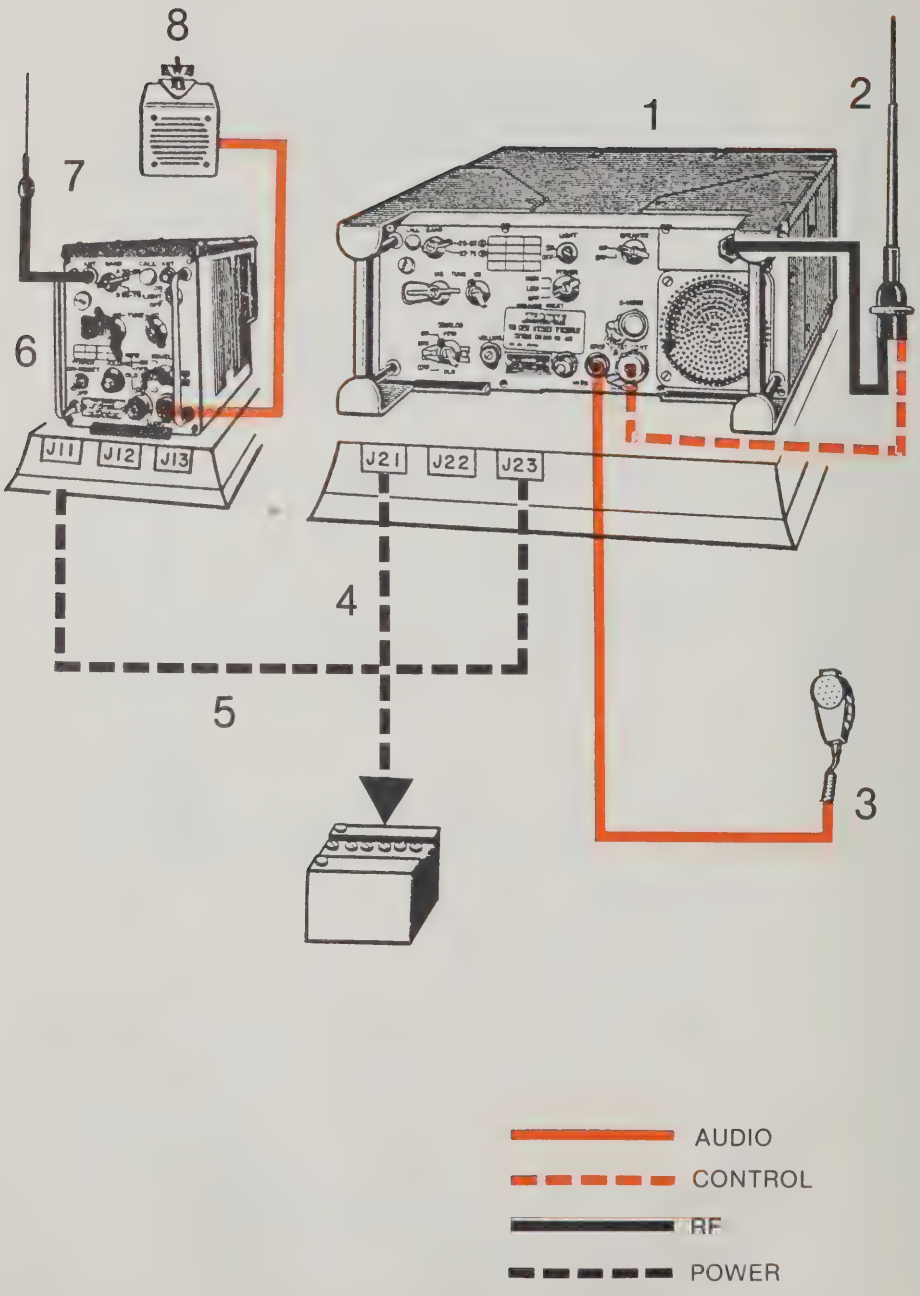
4 VINSON COMSEC EQUIPMENT.

5 POWER CABLE.
Gets power from the vehicle's battery for the electronic equipment.

NOTE

ONLY VINSON COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-18. THIS IS A TYPICAL



RADIO SET AN/VRC-47

1 R-T WITH SPEAKER ON ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

2 ANTENNA FOR R-T WITH SPEAKER.
One cable feeds rf signals to and from R-T.
Other cable controls circuits in the antenna base.

3 MICROPHONE.
Can be connected to the SPEAKER or RETRANSMIT R/W receptacles on the R-T.

4 POWER CABLE.
Gets power from the vehicle's battery for the radios.

5 POWER TRANSFER CABLE.
Connects the AUX RECEIVER to the R-T for power.

6 AUX RECEIVER WITH ITS MOUNT.
Underside of mount contains receptacles J11, J12 and J13.

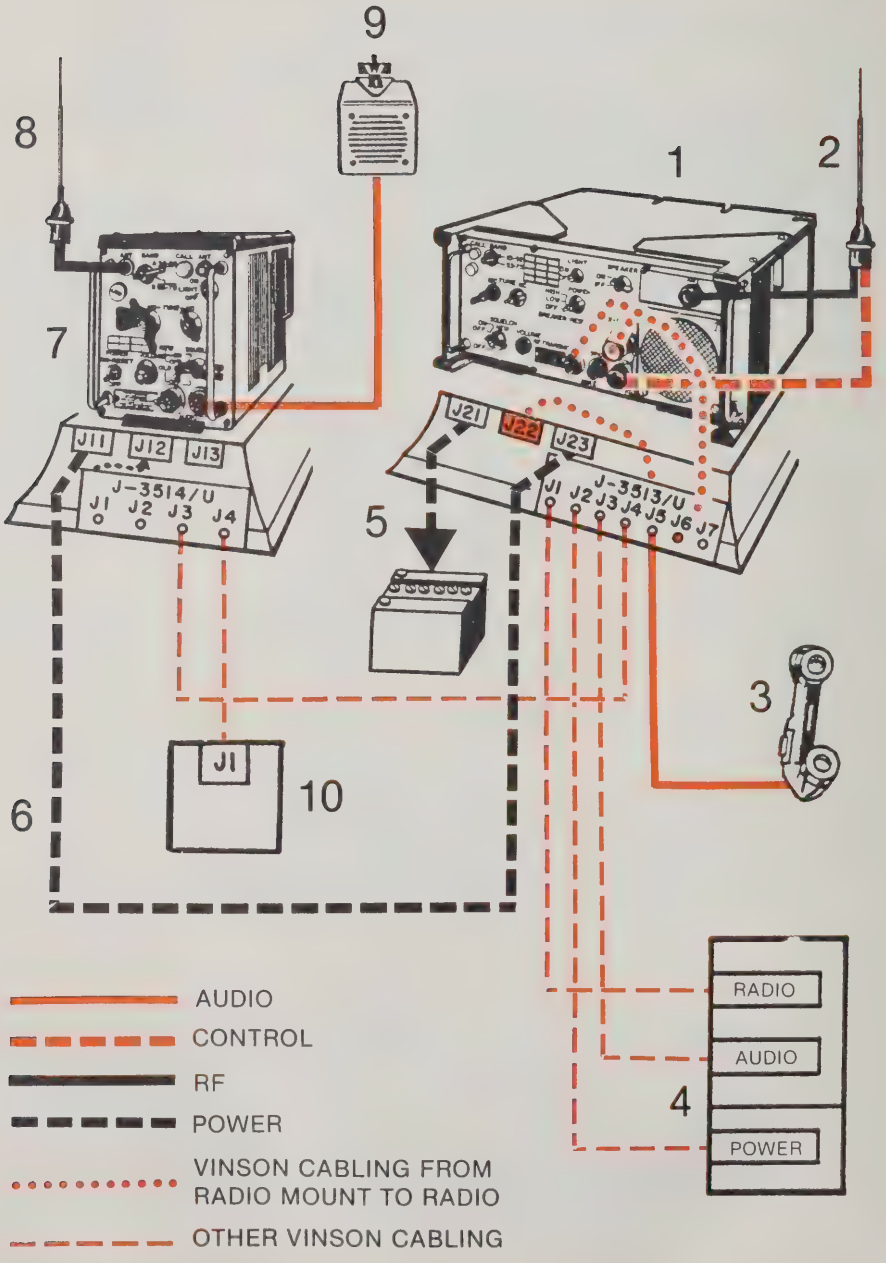
7 AUX RECEIVER ANTENNA.

8 AUX RECEIVER LOUDSPEAKER.
Loudspeaker has a short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.
2. R-T OPERATES ON ONE FREQUENCY AND AUX RECEIVER OPERATES ON ANOTHER FREQUENCY.
3. ONLY NESTOR COMSEC EQUIPMENT MAY BE USED WITH THIS HOOKUP.

1-19. THIS IS A TYPICAL



RADIO SET AN/VRC-47

1 R-T WITH SPEAKER ON VINSON R-T MOUNT.
Underside of mount has wired-in Interconnecting Box J3513/U.

2 ANTENNA FOR R-T.
One cable feeds rf signals to and from the R-T.
Other cable controls circuits in the antenna base.

3 HANDSET.
Used for both clear and secure communications.

4 VINSON COMSEC EQUIPMENT.
Can be shared between the R-T and AUX RECEIVER.

5 POWER CABLE.
Gets power from the vehicle's battery for the electronic equipment.

6 POWER TRANSFER CABLE.
Connects the AUX RECEIVER to the R-T for power.

7 AUX RECEIVER WITH VINSON AUX RECEIVER MOUNT.
Underside of mount has wired-in Interconnecting Box J-3514/U.

8 AUX RECEIVER ANTENNA.

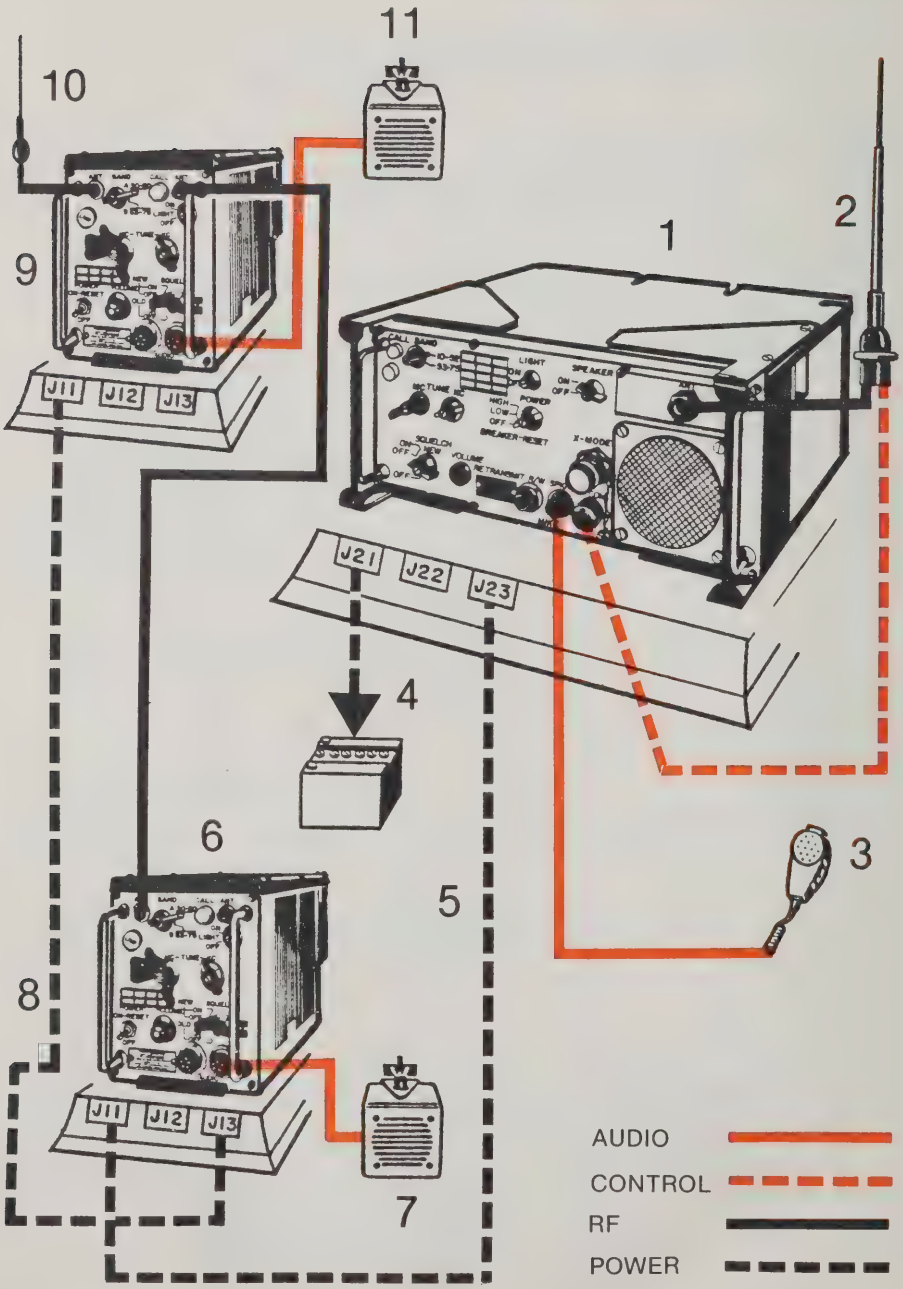
9 AUX RECEIVER LOUDSPEAKER.

10 VINSON SWITCH BOX (SA-2171/VRC).
Switches the VINSON COMSEC EQUIPMENT to either the R-T or AUX RECEIVER.

NOTES

1. ONLY VINSON COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.
2. R-T OPERATES ON ONE FREQUENCY AND THE AUX RECEIVER ON ANOTHER FREQUENCY.

1-20. THIS IS A TYPICAL



RADIO SET AN/VRC-48

1 R-T WITH SPEAKER ON ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

2 ANTENNA FOR R-T WITH SPEAKER.
One cable feeds rf signals to and from R-T.
Other cable controls circuits in the antenna base.

3 MICROPHONE.
Can be connected to either the RETRANSMIT R/W or SPEAKER receptacles on the R-T.

4 POWER CABLE.
Gets power from the vehicle's battery for the radios.

5 POWER TRANSFER CABLE.
Connects power to AUX RECEIVER NO. 1.

6 AUX RECEIVER NO. 1 WITH ITS MOUNT.
Underside of mount contains receptacles J11, J12 and J13.

7 LOUDSPEAKER FOR AUX RECEIVER NO. 1.
Loudspeaker has a short cable permanently attached to it.
A special extension cable is available to extend the loudspeaker.

8 POWER TRANSFER CABLE.
Connects power to AUX RECEIVER NO. 2.

9 AUX RECEIVER NO. 2 WITH ITS MOUNT.

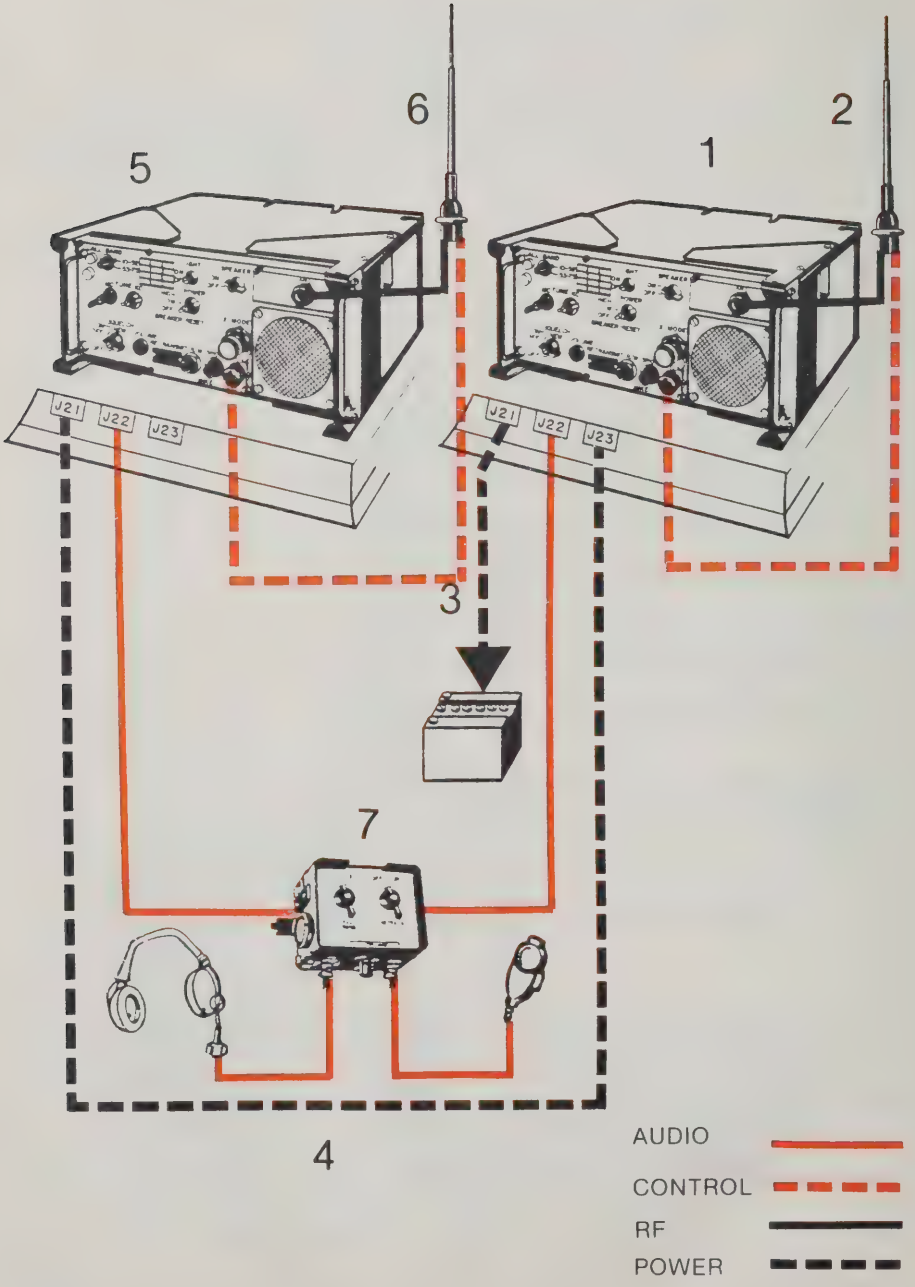
10 ANTENNA FOR BOTH AUX RECEIVERS.
One cable connects the antenna to AUX RECEIVER NO. 2.
Another cable connects the antenna from AUX RECEIVER NO. 2 to AUX RECEIVER NO. 1.

11 LOUDSPEAKER FOR AUX RECEIVER NO. 2.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.
2. R-T OPERATES ON ONE FREQUENCY AND EACH AUX RECEIVER OPERATES ON A DIFFERENT FREQUENCY.
3. ONLY NESTOR COMSEC EQUIPMENT MAY BE USED WITH THIS HOOKUP.

1-21. THIS IS A TYPICAL



RADIO SET AN/VRC-49

1 R-T WITH SPEAKER NO. 1 ON ITS MOUNT.
Underside of mount contains receptacles J21, J22 and J23.

2 ANTENNA FOR R-T NO. 1 WITH SPEAKER.
One cable feeds rf signals to and from R-T.
Other cable controls circuits in the antenna base.

3 POWER CABLE.
Gets power from the vehicle's battery for the radios.

4 POWER TRANSFER CABLE.
Connects power to R-T WITH SPEAKER NO. 2.

5 R-T WITH SPEAKER NO. 2 ON ITS MOUNT.

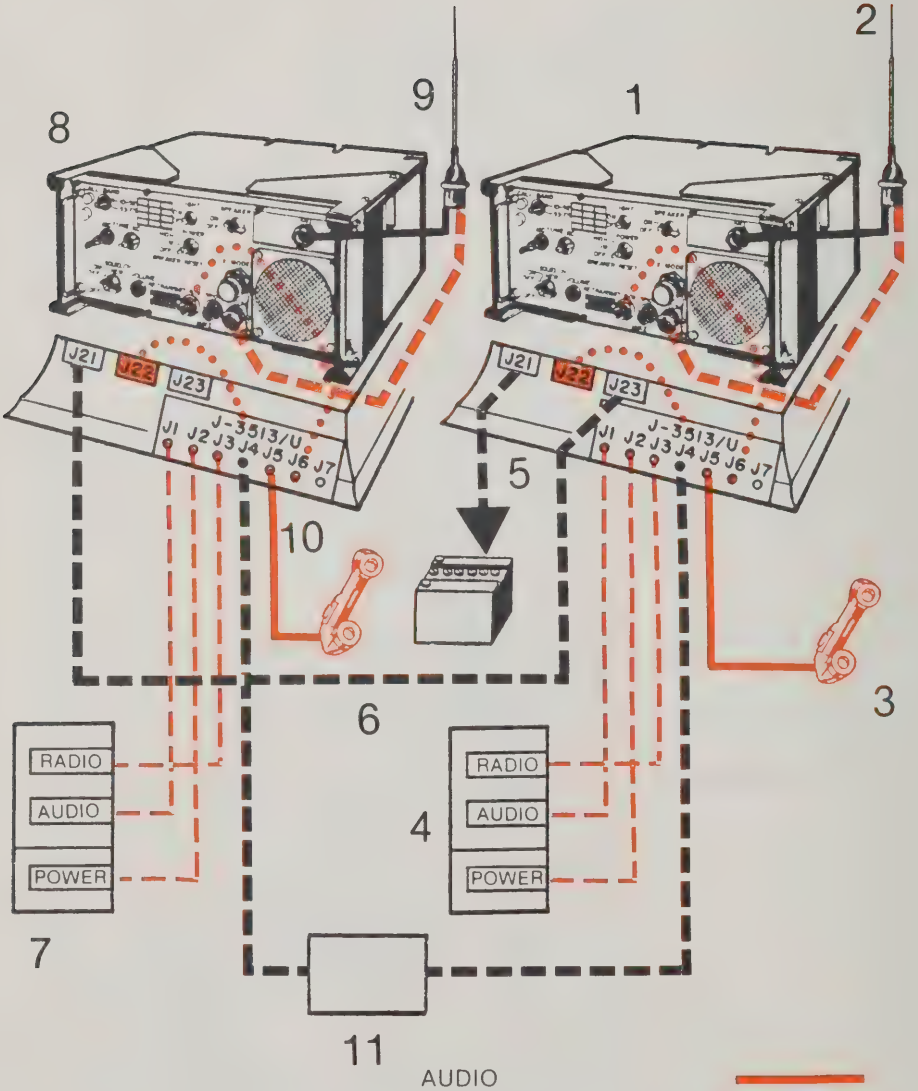
6 ANTENNA FOR R-T NO. 2.

7 RADIO RELAY BOX.
The RADIO RELAY BOX is being used in its normal way for radio relay operation and audio accessory connection.

NOTES

1. ANY COMBINATION OF AUDIO ACCESSORIES AS SHOWN IN PARAGRAPHS 1-26 AND 1-27 MAY BE USED.
2. EACH R-T OPERATES ON A DIFFERENT FREQUENCY. PROVIDES RETRANSMISSION (RADIO RELAY) CAPABILITY.
3. ONLY NESTOR COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.

1-22. THIS IS A TYPICAL



RADIO SET AN/VRC-49

1 R-T WITH SPEAKER ON VINSON R-T MOUNT.
Underside of mount has wired-in Interconnecting Box J-3513/U.

2 ANTENNA FOR R-T.
One cable feeds rf signals to and from R-T.
Other cable controls circuits in the antenna base.

3 HANDSET.
Used for both clear and secure communications.

4 VINSON COMSEC EQUIPMENT.

5 POWER CABLE.
Gets power from the vehicle's battery for the electronic equipment.

6 POWER TRANSFER CABLE.
Connects power to the other R-T.

7 VINSON COMSEC EQUIPMENT FOR THE OTHER R-T.

8 R-T WITH SPEAKER ON VINSON R-T MOUNT.

9 ANTENNA FOR R-T.

10 HANDSET.

11 VINSON RELAY BOX (C-10734/VRC).
When using VINSON COMSEC EQUIPMENT, this box must be used in place of the regular RADIO RELAY BOX (C-2299/VRC).

NOTES

1. ONLY VINSON COMSEC EQUIPMENT CAN BE USED WITH THIS HOOKUP.
2. EACH R-T OPERATES ON A DIFFERENT FREQUENCY. THIS PROVIDES RADIO RELAY (RETRANSMISSION) CAPABILITY.

1-23. PERFORMANCE DATA USING EXTENDED RANGE ANTENNA (RC-292 OR OE-2541/GRC)

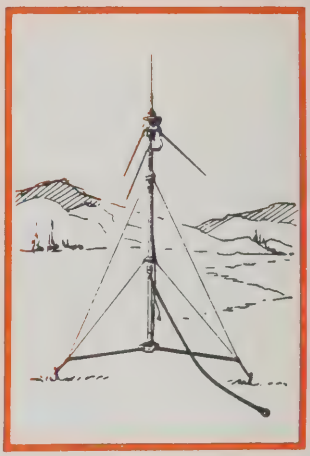
- ANTENNA ERECTION FOR A TEAM OF 2 IS APPROXIMATELY 15 MINUTES.
- C-E ORG MAINT SHOULD PROVIDE THE EXTRA LONG CABLES NEEDED TO MAKE CONNECTIONS TO THE R-T.
- APPROXIMATE RANGE BETWEEN 2 AN/VRC-12 SERIES OF RADIOS WITH BOTH RADIOS USING THE EXTENDED RANGE ANTENNA.

  36 miles over average terrain.

  30 miles over difficult terrain.
- APPROXIMATE RANGE BETWEEN 1 AN/VRC-12 RADIO SET USING THE EXTENDED RANGE ANTENNA AND THE OTHER AN/VRC-12 RADIO USING A WHIP ANTENNA.

  25 miles over average terrain.

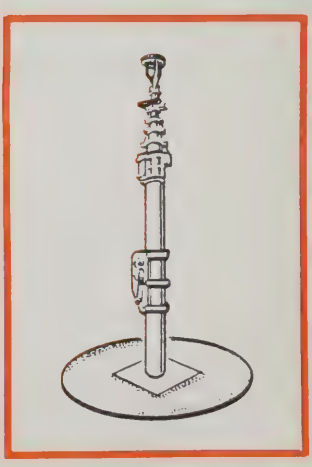
  20 miles over difficult terrain.



1-24. PERFORMANCE DATA USING TELESCOPING ANTENNA MAST (AB-903/G)

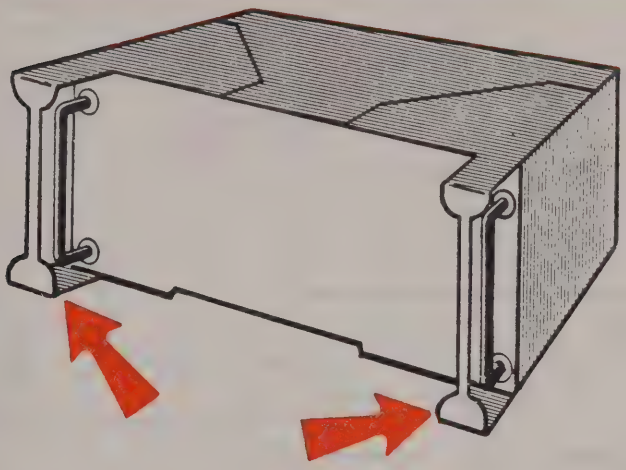
- EITHER THE COMPACT ANTENNA MATCHING UNIT (MX-9146/GRC) OR THE ROUND BASE ANTENNA MATCHING UNIT (MX-6707) IS PLACED ATOP THE TELESCOPING ANTENNA MAST.
- THE TELESCOPING ANTENNA MAST CAN BE HANDCRANKED FROM 6 FEET TO APPROXIMATELY 30 FEET.

  Time required to handcrank is approximately 25 seconds.
- THE TELESCOPING ANTENNA MAST CAN BE ATTACHED TO THE SIDE OF A VEHICLE OR MOUNTED ON THE GROUND.

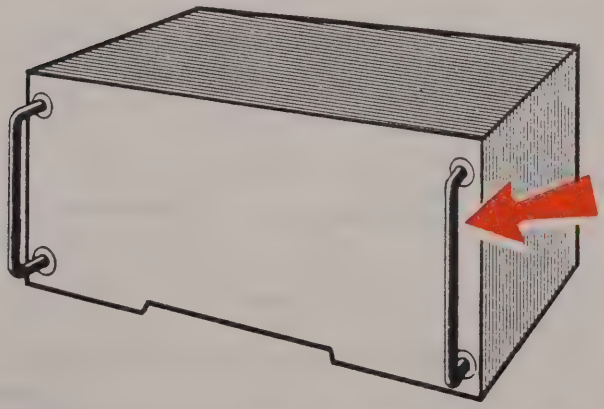


Section III. DIFFERENCES BETWEEN MODELS

1-25. DIFFERENCES IN R-T HANDLE ASSEMBLIES



All plain model R-T's have a pair of handle assemblies installed over the front guards.



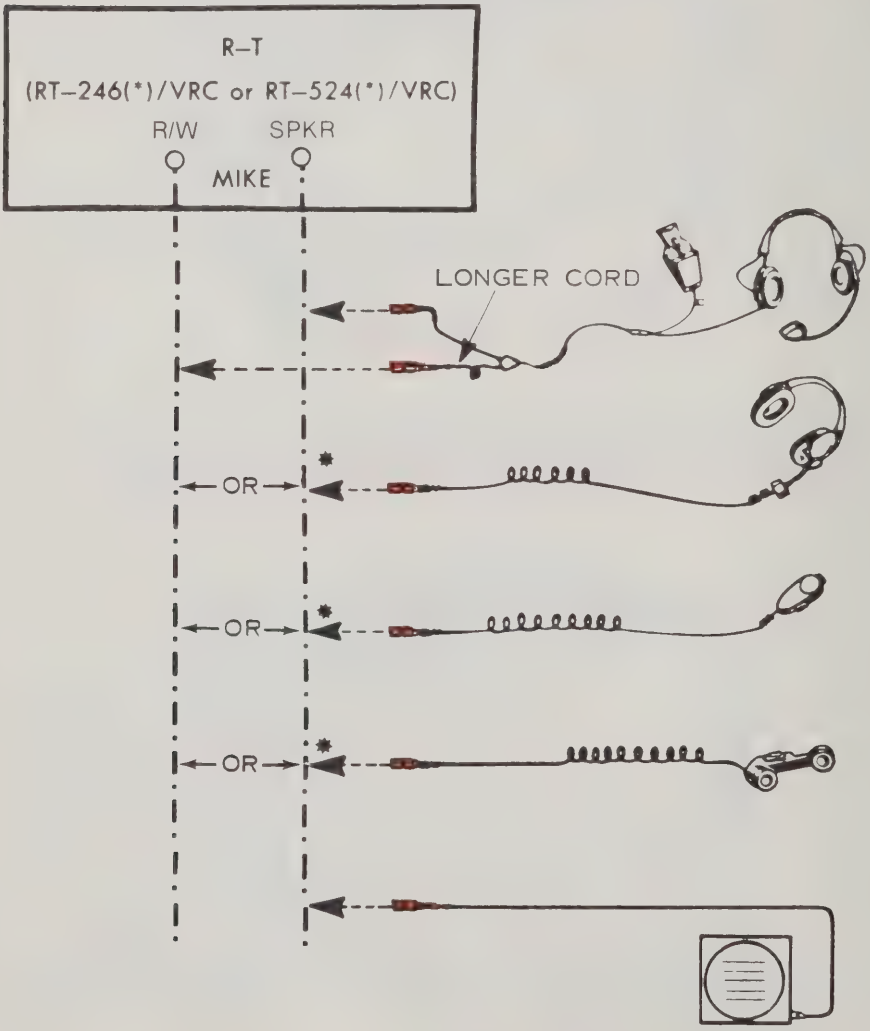
The A model R-T's do not have handle assemblies because their front panel guards are more ruggedly attached to the front panel.

NOTE

The handle assemblies are also provided on some A model R-T's from which one or both front panel guards were removed.

1-26. DIFFERENT CONNECTIONS OF AUDIO ACCESSORIES TO R-T FRONT PANEL

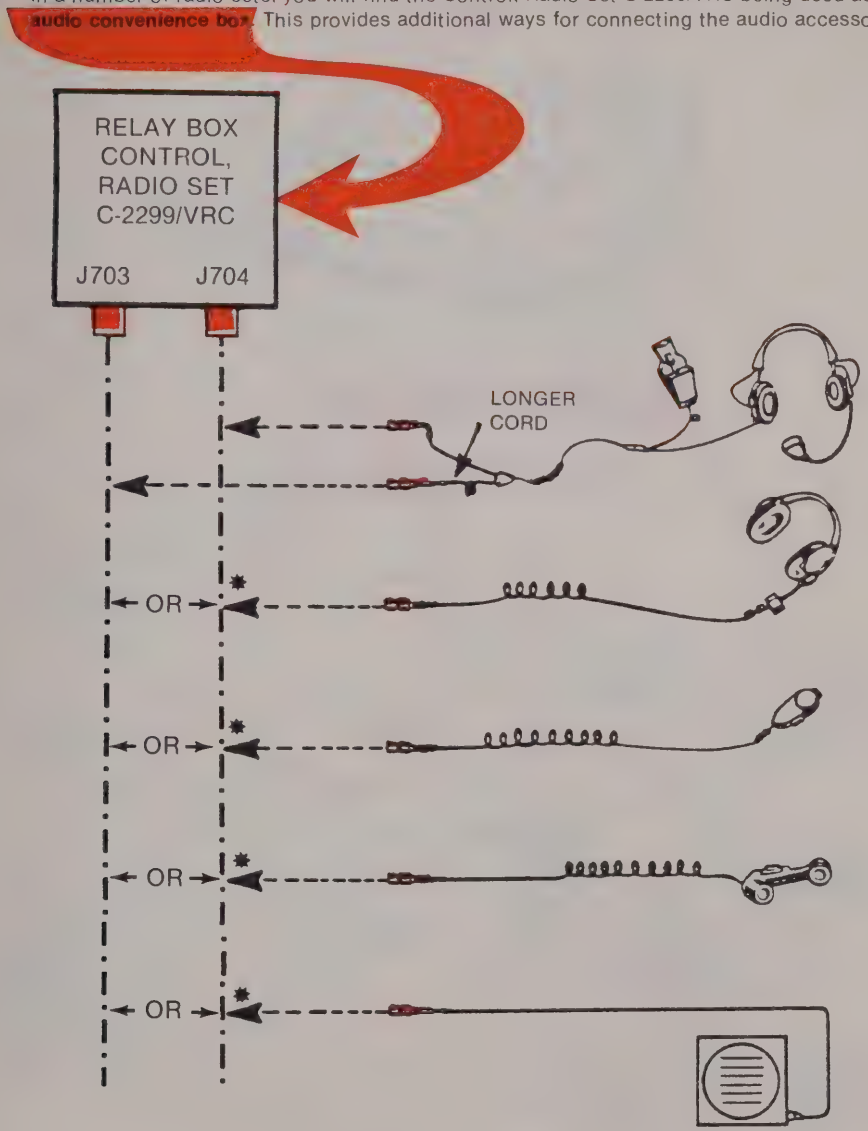
The number and type of audio accessories you will use is determined by your mission. The R-T's are designed to provide a variety of ways for you to connect the available audio accessories.



*May be connected to either the R/W or SPKR receptacle on the R-T.

1-27. DIFFERENT CONNECTIONS TO RADIO RELAY BOX (C-2299/VRC)

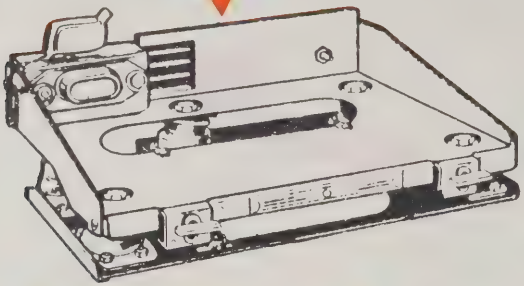
In a number of radio sets, you will find the Control, Radio Set C-2299/VRC being used as an audio convenience box. This provides additional ways for connecting the audio accessories.



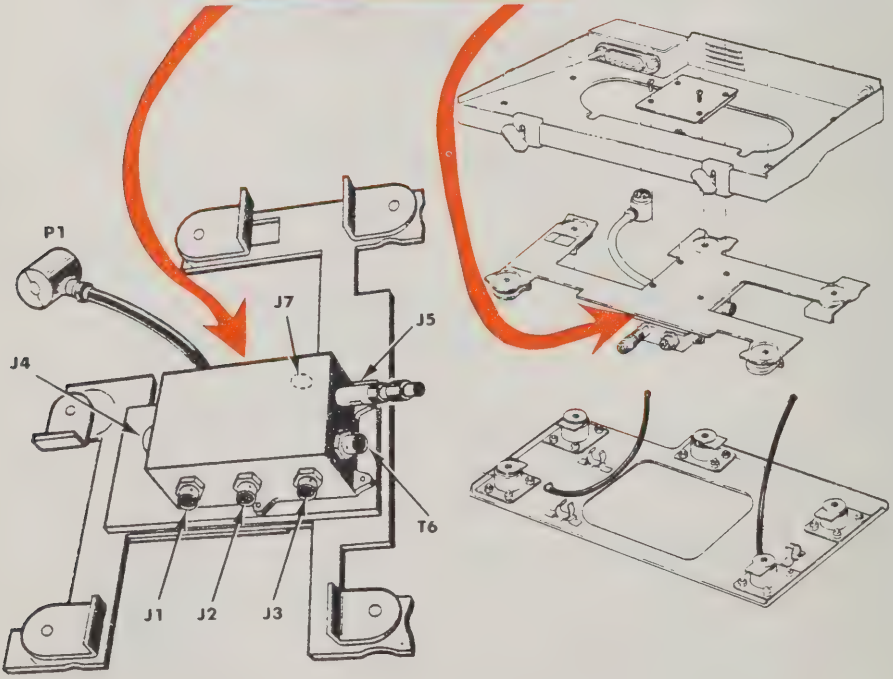
*May be connected to either receptacle J703 and J704 on the audio convenience box (C-2299/VRC).

1-28. DIFFERENCES IN RECEIVER-TRANSMITTER MOUNTS

- Whenever a regular R-T MOUNT (MT-1029/VRC) is modified



to include INTERCONNECTING BOX J-3513/U



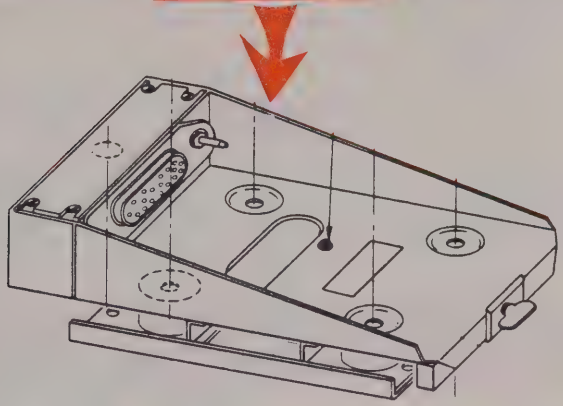
it becomes a VINSON R-T MOUNT.

NOTE

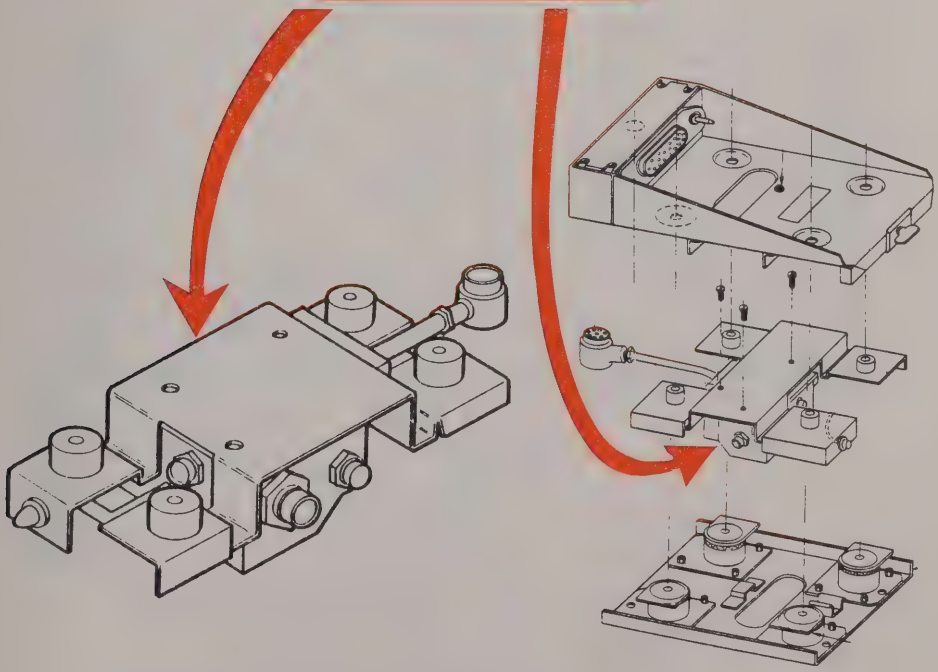
Only VINSON COMSEC equipment can be used in the radio system.

1-29. DIFFERENCES IN AUX RECEIVER MOUNTS

*Whenever a regular AUX RECEIVER MOUNT (MT-1898/VRC) is modified to



include INTERCONNECTING BOX J-3514/U ,



it becomes a VINSON AUX RECEIVER MOUNT.

NOTE

Only VINSON COMSEC equipment can be used in the radio system.

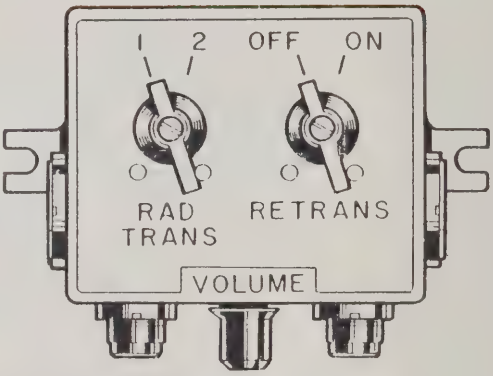
1-30. DIFFERENCES IN RADIO RELAY BOXES

- Regular RADIO RELAY BOX (Control, Radio Set C-2299/VRC) is used in radio relay hookups of Radio Sets AN/VRC-45 and AN/VRC-49.

BUT

Only NESTOR COMSEC equipment can be used in the radio system.

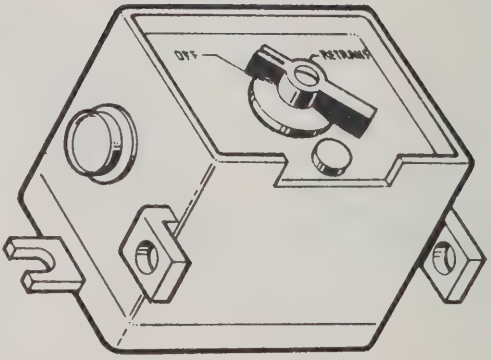
It also can be used as a convenience box for the connection of audio accessories.



- VINSON RELAY BOX (Control, Retransmission C-10734/VRC) can only be used in radio relay hookups with Radio Set AN/VRC-45 or AN/VRC-49.

BUT

Only VINSON COMSEC equipment can be used in the radio system.



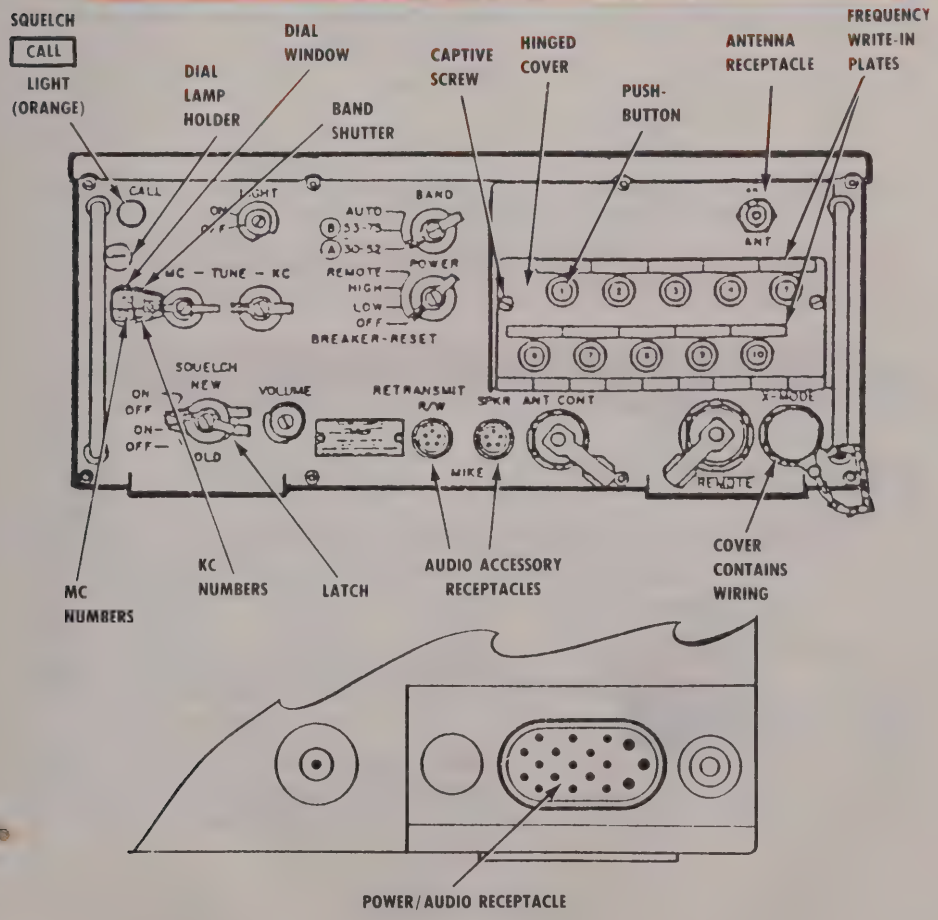
CHAPTER 2
OPERATING INSTRUCTIONS

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS, INDICATORS AND RECEPTACLES

CAUTION

THIS SECTION EXPLAINS THE PURPOSE AND FUNCTION OF YOUR CONTROLS, INDICATORS AND RECEPTACLES. EXACTLY HOW THEY ARE USED IS EXPLAINED IN THE "OPERATION UNDER USUAL CONDITIONS" SECTION. DO NOT ATTEMPT TO OPERATE YOUR EQUIPMENT UNTIL YOU FULLY UNDERSTAND THIS SECTION AND THE "OPERATION UNDER USUAL CONDITIONS" SECTION.

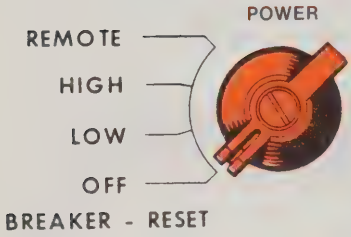
2-1. LOCATION OF ALL CONTROLS, INDICATORS AND RECEPTACLES ON PUSHBUTTON R-T (RT-246(*)/VRC).



2-2. POWER SWITCH ON PUSHBUTTON R-T (RT-246(*)/VRC)

POWER switch has 4 positions.

OFF BREAKER-RESET Removes power from the R-T and resets circuit breakers (inside the R-T) if they are tripped.



LOW turns on dc power to PUSHBUTTON R-T; when R-T is keyed, it transmits on low rf power (0.5 to 8 watts).

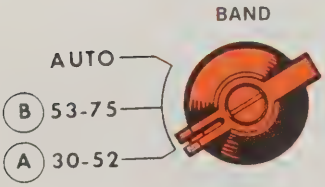
HIGH turns on dc power to PUSHBUTTON R-T; when R-T is keyed, it transmits on high rf power (35 watts minimum).

REMOTE transfers control of dc power and selection of R-T frequency to the REMOTE CONTROL BOX (C-2742/VRC) when it is connected to the REMOTE receptacle on the R-T.

2-3. BAND SWITCH ON PUSHBUTTON R-T (RT-246(*)/VRC)

BAND switch has 3 positions.

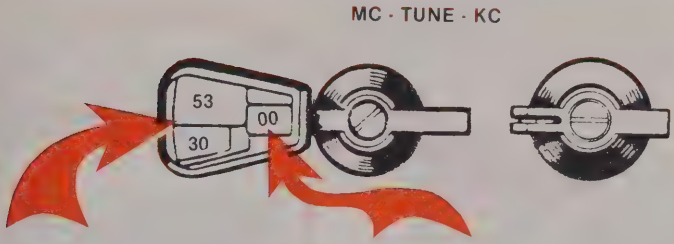
(A) 30-52 position sets up R-T circuits for manual tuning band A (30.00 MHz to 52.95 MHz).



(B) 53-75 position sets up R-T circuits for manual tuning band B (53.00 MHz to 75.95 MHz).

AUTO position permits automatic tuning of the PUSHBUTTON R-T when you use the pushbuttons.

2-4. MC-TUNE-KC CONTROLS FOR MANUAL TUNING OF PUSH-BUTTON R-T (RT-246(*)/VRC)



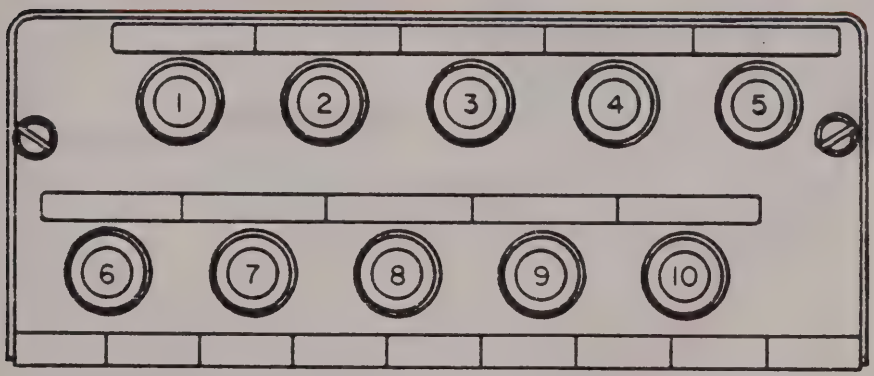
MC control provides manual tuning of R-T in 1 mHz steps (30.31. 53. 54 etc.) as shown on the outer section of the dial.

KC control provides manual tuning of R-T in 0.05 mHz steps (00. 05. 10. 15 etc.) as shown on the inner section of the dial.

NOTE

A shutter covers the MC numbers of the BAND not being used.

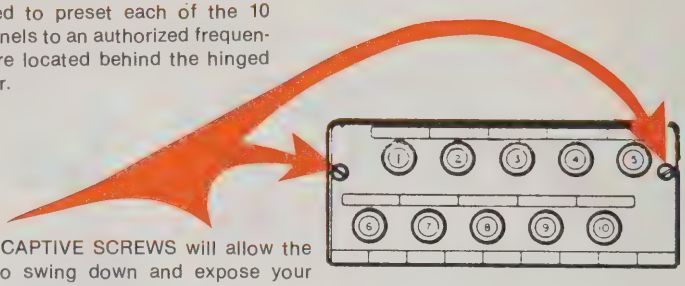
2-5. PUSHBUTTONS ON PUSHBUTTON R-T (RT-246(*)/VRC)



Any one of 10 preset channel frequencies for the PUSHBUTTON R-T can be selected by pressing the proper PUSHBUTTON.

2-6. CONTROLS FOR PRESETTING THE PUSHBUTTONS ON PUSH-BUTTON R-T (RT-246(*)/VRC)

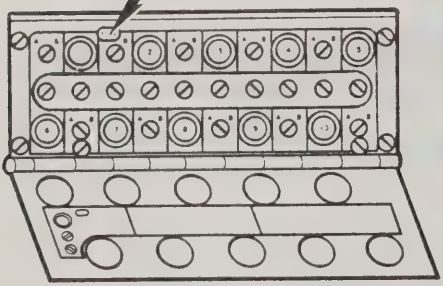
You will be required to preset each of the 10 PUSHBUTTON channels to an authorized frequency. Your controls are located behind the hinged PUSHBUTTON cover.



Loosening the CAPTIVE SCREWS will allow the hinged cover to swing down and expose your PUSHBUTTON PRESETTING controls.

BEHIND THE HINGED COVER YOU WILL FIND:

TUNE button. One for use with all 10 channels. Must be pushed in to allow PRESET CONTROL adjustments to be made.



BAND SELECTOR SWITCH

One for each channel.

PRESET CONTROL

One for each channel. Adjusts PUSHBUTTON R-T tuning circuits to desired frequency.

NOTES

1. Remember, your PUSHBUTTONS will only work if you have placed the **BAND** switch to **AUTO**.

2. During PUSHBUTTON tuning, the frequency of the channel you have selected will appear in the dial window.

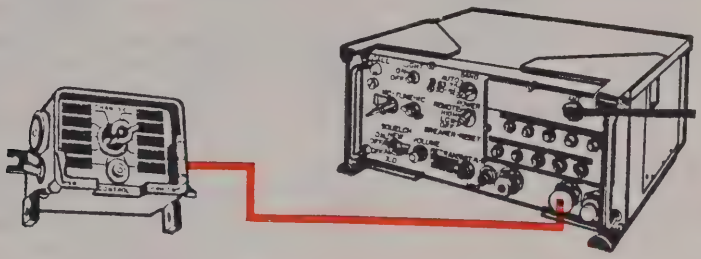
3. Write in the frequency for each pushbutton on the write-in plates on the front of the hinged cover.

2-7. OPERATOR'S CONTROLS ON REMOTE CONTROL BOX (C-2742/VRC)

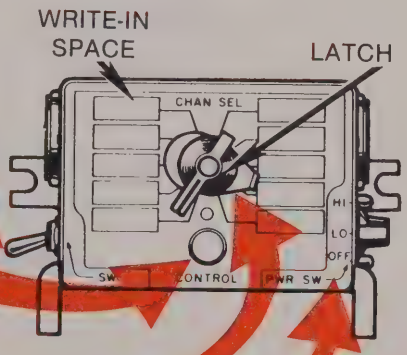
After presetting the pushbuttons on your PUSHBUTTON R-T, you can use remote control.

BUT------FIRST----

You must make sure that your REMOTE CONTROL BOX is connected to the REMOTE receptacle on the front panel of your PUSHBUTTON R-T.



REMOTE CONTROL BOX (C-2742/VRC) CONTROLS



SW switch and **CONTROL** indicator lamp

SW switch is spring loaded.

When pressed, the **CONTROL** indicator lamp lights

AND

You now have control of the PUSHBUTTON R-T.

CHAN SEL switch.

Used to select any one of the 10 preset frequencies.

PWR SW switch to used to:

Control power to the R-T
and
R-T power output:

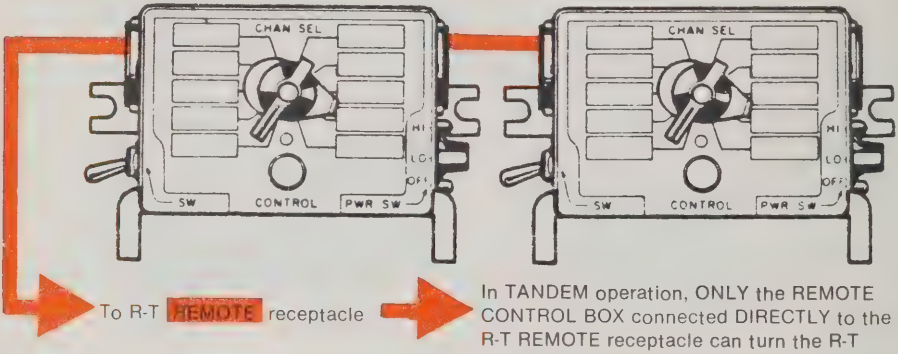
OFF removes power from PUSHBUTTON R-T.

LO PUSHBUTTON R-T transmits on low power.

HI PUSHBUTTON R-T transmits on high power.

2-8. OPERATOR'S CONTROLS FOR TANDEM OPERATION OF REMOTE CONTROL BOXES (C-2742/VRC)

Two REMOTE CONTROL BOXES (C-2742/VRC) can be connected in TANDEM as shown below.



Only one REMOTE CONTROL BOX can control the PUSHBUTTON R-T at one time.

Pressing the SW toggle switch on your REMOTE CONTROL BOX will:

make your CONTROL lamp light

and

the CONTROL lamp on the other box to go out

and

when you release your SW toggle switch, your CONTROL lamp will stay lighted, indicated you have control of the R-T.

NOTES

1. Remember, a REMOTE CONTROL BOX will not operate unless:

   The proper cable connections have been made to the REMOTE receptacle on the front panel of the PUSHBUTTON R-T
   and
   The BAND switch on the PUSHBUTTON R-T is set to AUTO
   and
   The POWER switch on the PUSHBUTTON R-T is set to REMOTE

2. During remote control operation, the frequency of the channel you selected will appear in the R-T dial window.

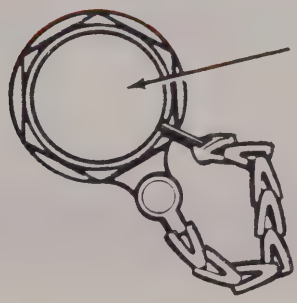
3. Don't forget to write in the preset frequencies on the space of the front of the REMOTE CONTROL BOX.

4. To return control of the PUSHBUTTON R-T to its front panel controls, turn the PUSHBUTTON R-T POWER switch from REMOTE to HI or LO

2-9. PUSHBUTTON R-T (RT-246(*)/VRC) X-MODE RECEPTACLE

- Your PUSHBUTTON R-T can be used for X-MODE operation.
- This mode is used for sending and receiving secure voice or digital signals with special equipment connected to your R-T.
- This special equipment is connected by authorized personnel to the X-MODE receptacle on the front panel of your PUSHBUTTON R-T.
- When the cover is taken off the X-MODE receptacle, special circuits inside your R-T are disconnected because the cover contained wiring to connect these circuits.

X-MODE



COVER CONTAINS WIRING

AND

- When the cable for the X-MODE equipment is connected to your X-MODE receptacle, these circuits are reconnected in a special way.
- REMEMBER, if no cable is connected to your front panel X-MODE receptacle, make sure the cover is snugly screwed on the X-MODE receptacle.

2-10. AUDIO ACCESSORY RECEPTACLES ON PUSHBUTTON R-T (RT-246(*)/VRC)

Your audio accessories are normally connected to a box. Example: Interconnecting Box, Radio Relay Box.

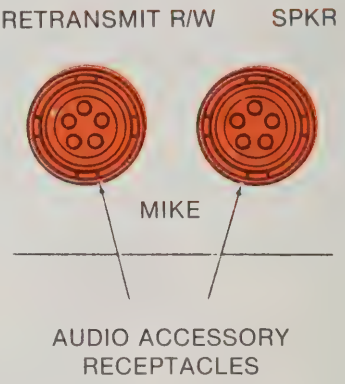
BUT

There are times you may need to connect your audio accessories to the receptacles on the front panel of your PUSHBUTTON R-T.

Exactly how and when you do this is covered in the other section of this technical manual.

ALSO

During special operations like RADIO WIRE INTEGRATION (RWI) X-MODE, special cables may be connected to these receptacles.



AUDIO ACCESSORY RECEPTACLES

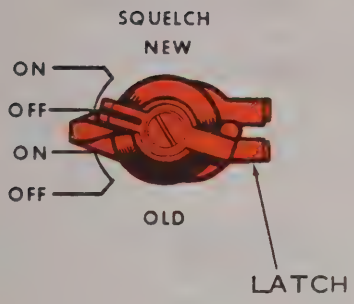
2-11. VOLUME CONTROL ON PUSHBUTTON R-T (RT-246(*)/VRC)

You can adjust the volume level to any loudspeaker or earphone connected to or through the RETRANSMIT R/W or SPKR receptacles on the front panel of the PUSHBUTTON R-T.

2-12. SQUELCH CONTROL ON PUSHBUTTON R-T (RT-246(*)/VRC)

WHAT IS SQUELCH?

When you are listening to an unsquelch fm receiver, you will hear a constant rushing and hissing sound until the distant transmitter is keyed.



When the distant transmitter stops transmitting, the rushing and hissing sound returns.

With SQUELCH, your receiver is silenced during the time the transmitter is not keyed. When the distant transmitter is keyed, your receiver SQUELCH circuits are automatically disabled and you can hear the message.

New fm radio sets like the AN/VRC-12 have a new squelch design to automatically disable the distant receiver SQUELCH circuits.

Operating with newer sets or another AN/VRC-12 is normally done with all receiver and transmitter SQUELCH controls in the NEW ON positions.

BUT

You may be asked to communicate with some older types of fm radio sets that use an old design for disabling receiver SQUELCH circuits.

Operating your AN/VRC-12 radio set with older sets is done with the receiver and transmitter SQUELCH controls in the OLD ON positions.

A latch allows you to restrict the SQUELCH switch movement to OLD or NEW squelch operation.

NOTE

FOR RELIABLE COMMUNICATIONS, MAKE SURE THAT THE DISTANT STATION AND YOU HAVE YOUR SQUELCH CONTROLS IN THE SAME POSITION.

2-13. LAMPS AND INDICATORS ON PUSHBUTTON R-T (RT-246(*)/VRC)

CALL lamp (ORANGE)

During SQUELCH operation, it lights up to indicate that a signal is being received.

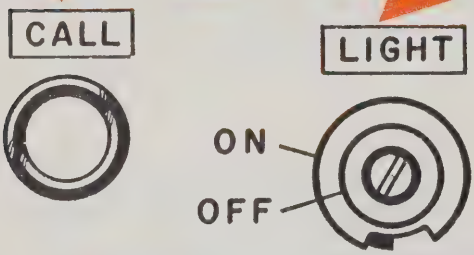
BUT

You must have the SQUELCH control set to NEW ON or OLD ON

AND

the LIGHT switch to ON.

LIGHT switch.



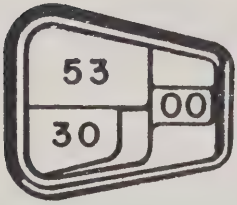
Controls power to DIAL WINDOW LAMP.

AND

to squelch CALL lamp.

DIAL WINDOW LAMP

Contains the lamp to light the DIAL WINDOW.



NOTE

The lamp will light only if you have the LIGHT switch at ON.

2-14. ANT RECEPTACLE ON PUSHBUTTON R-T (RT-246(*)/VRC)

ANT

The thin antenna cable is connected to this receptacle.

2-15. ANT CONT RECEPTACLES ON PUSHBUTTON R-T (RT-246(*)/VRC)

A cable connection is made from this receptacle to the base of the:

COMPACT ANTENNA MATCHING UNIT (MX-9146/GRC)

OR

ROUND BASE ANTENNA MATCHING UNIT (MX-6707/VRC)

OR

BOX BASE ANTENNA MATCHING UNIT (MX-2799/VRC).

AND

Whenever you change the R-T frequency, the proper circuits in the antenna matching unit are automatically selected.

2-16. POWER/AUDIO RECEPTACLE ON PUSHBUTTON R-T (RT-246(*)/VRC)

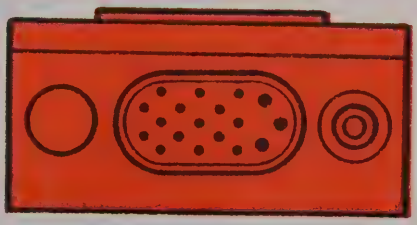
Located in the rear of the PUSHBUTTON R-T.

This is the main channel for:

Power to the PUSHBUTTON R-T.

AND

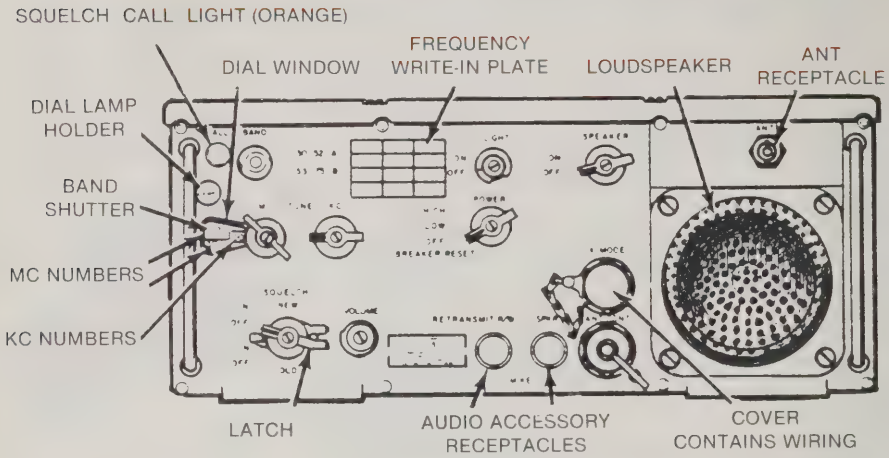
Passage of the dc power and control and audio signals between the PUSHBUTTON R-T and equipment connected to the underside of the PUSHBUTTON R-T MOUNT.



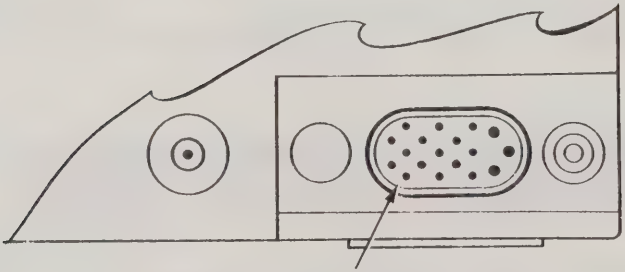
CAUTION

Always carefully check the pins on this receptacle before placing an R-T on the R-T MOUNT.

2-17. LOCATION OF ALL CONTROLS, INDICATORS AND RECEPTACLES ON R-T WITH SPEAK (RT-524(*)/VRC)



FRONT PANEL



POWER/AUDIO RECEPTACLE (P401)
REAR VIEW

NOTES

1. The operator's controls, indicators and receptacles on the R-T WITH SPEAK (RT-524(*)/VRC are identical with those on the PUSHBUTTON R-T (RT-246(*)/VRC), except for PUSHBUTTON TUNING and REMOTE CONTROL.

2. The R-T WITH SPEAKER (RT-524(*)/VRC) has a build-in loudspeaker and a SPEAKER switch in place of the pushbutton machinery.

3. The SPEAKER switch turns the built-in loudspeaker ON or OFF and controls the volume.

2-18. OPERATOR'S CONTROLS ON RADIO RELAY BOX (C-2299/VRC) FOR RADIO RELAY OPERATION

Radio Set AN/VRC-45(*) or AN/VRC-49(*)/VRC can be used for automatic retransmission (radio relay).

RADIO RELAY BOX (C-2299/VRC) must be used with these radio sets if NESTOR COMSEC equipment is used in the system.

Controls on RADIO RELAY BOX (C-2299/VRC).

RETRANS switch.

OFF permits both R-T's to operate independently.

AND

Radio relay operation is NOT possible.

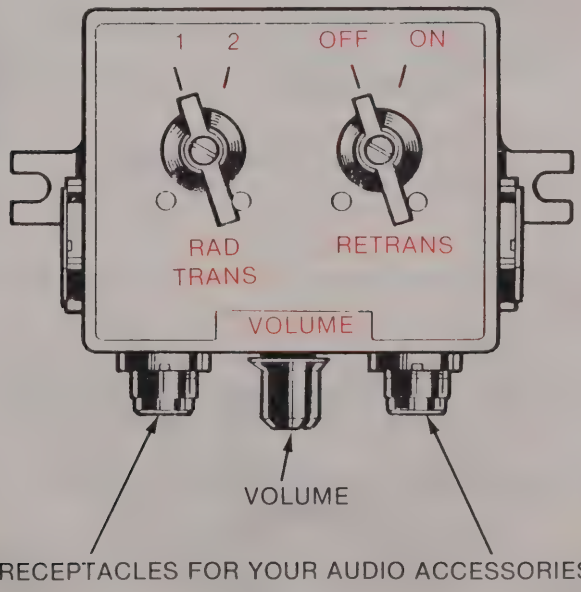
ON Connects both R-T's for automatic radio relay operation.

VOLUME control.

If you want to listen to the radio relay signals, you can connect an audio accessory to either audio receptacle on the RADIO RELAY BOX.

AND

You then can use the VOLUME control to adjust the loudness of the signals to which you are listening.



2-18. OPERATOR'S CONTROLS ON RADIO RELAY BOX (C-2299/VRC) FOR RADIO RELAY OPERATION - Continued

With the RETRANS switch on your RADIO RELAY BOX at OFF, you do not have retransmission (radio relay) capability.

BUT

You can use your 2 R-T's to communicate with the distant terminal stations.

You must communicate with the terminal stations before you turn your 2 R-T's over to them for radio relay operation.

You can use an audio accessory connected to either audio receptacle on the RADIO RELAY BOX.

You select the terminal you want to communicate with by using the RAD TRANS switch.

RAD TRANS switch.

Position 1 allows you to communicate with one terminal.

Position 2 allows you to communicate with the other terminal.

AND

After you have communicated and coordinated with both terminals, you place your RETRANS switch to ON.

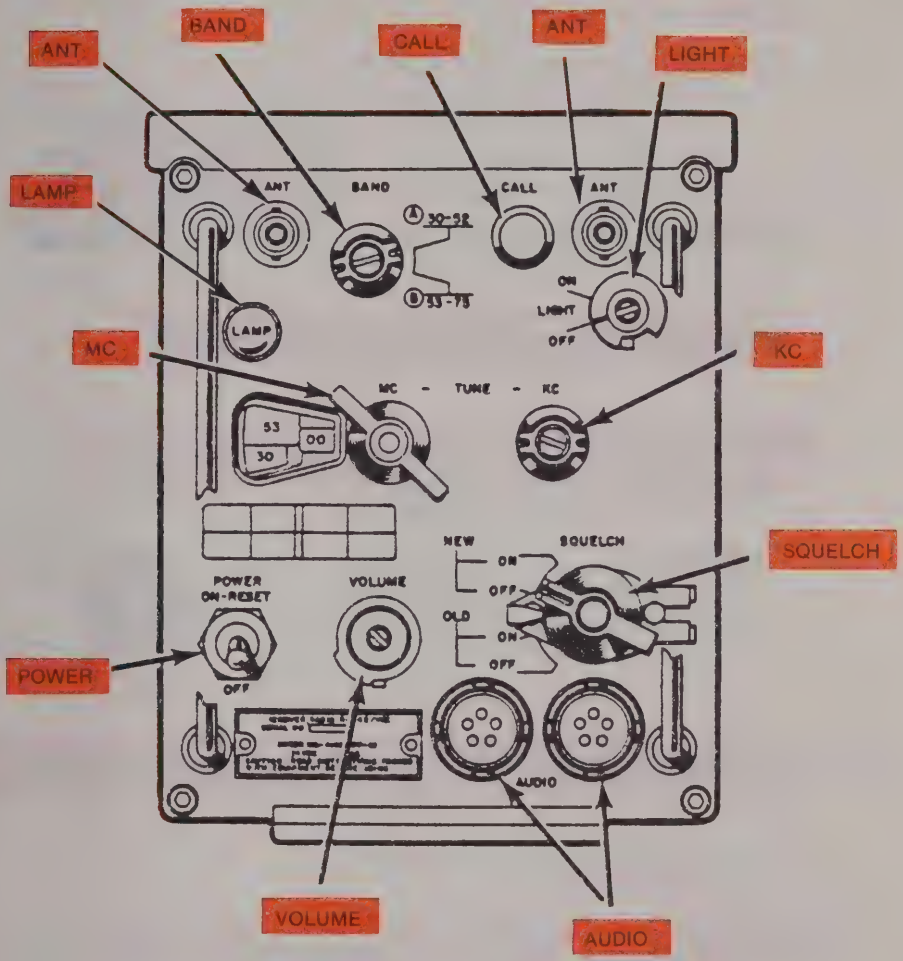
NOW

Your 2 R-T's are under the control of the terminals for radio relay operation.

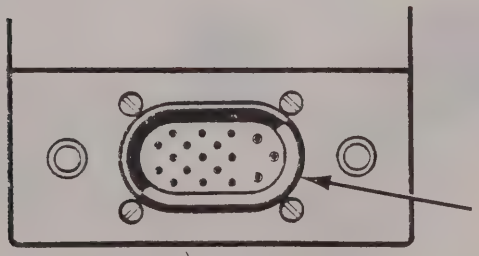
CAUTION

IF VINSON COMSEC EQUIPMENT IS USED IN THE COMMUNICATIONS SYSTEM, YOU MUST USE VINSON RADIO RELAY BOX (C-10734/VRC) IN PLACE OF RADIO RELAY BOX (C-2299/VRC).

2-19. LOCATION OF ALL CONTROLS, INDICATORS AND RECEPTACLES ON AUX RECEIVER (R-44(*)/VRC)



FRONT PANEL



REAR VIEW

2-20. POWER SWITCH ON AUX RECEIVER (R-442(*)/VRC)

POWER switch has 2 positions.

ON-RESET applies power to AUX RECEIVER

AND

resets built-in circuit breaker if it is tripped.

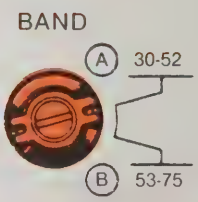
OFF removes power from AUX RECEIVER.

2-21. BAND SWITCH ON AUX RECEIVER (R-44(*)/VRC)

BAND switch has 2 positions.

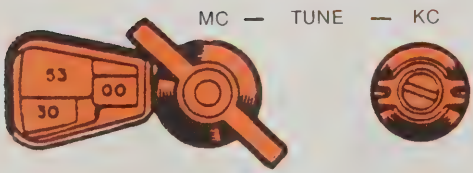
(A) 30-52 position sets AUX RECEIVER for tuning band A (30.00 mHz to 52.95 mHz).

(B) 53-75 position sets up AUX RECEIVER for tuning band B (53.00 mHz to 75.95 mHz).



2-22. MC-TUNE-KC CONTROLS ON AUX RECEIVER (R-442(*)/VRC)

Your AUX receiver can only be tuned manually using the MC and KC controls.



MC control provides manual tuning of the AUX RECEIVER in 1 mHz steps (30, 31, 53, 54 etc) as indicated on the outer section of the dial window.

KC control provides manual tuning of the AUX RECEIVER in 0.05 mHz steps (00, 05, 10, 15 etc) as indicated on the inner section of the dial window.

2-23. AUDIO ACCESSORY RECEPTACLE ON AUX RECEIVER (R-442(*)/VRC)

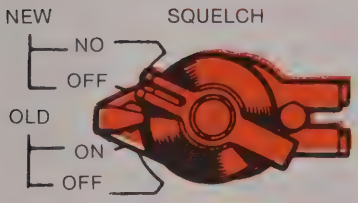
There are 2 identical AUDIO accessory receptacles.

During normal operation, your audio accessories may be connected to the two AUDIO receptacles in the combinations shown throughout this technical manual.

2-24. VOLUME CONTROL ON AUX RECEIVER (R-442(*)/VRC

You can adjust the volume level to any audio accessory (loudspeaker or earphone) connected to the AUDIO receptacles on the AUX RECEIVER front panel.

2-25. SQUELCH CONTROL ON AUX RECEIVER (R-442(*)/VRC)



The AUX receiver SQUELCH control is operated the same way as the SQUELCH control on the R-T.

2-26. LAMPS AND INDICATORS ON AUX RECEIVER (R-442(*)/VRC)

CALL lamp (ORANGE).

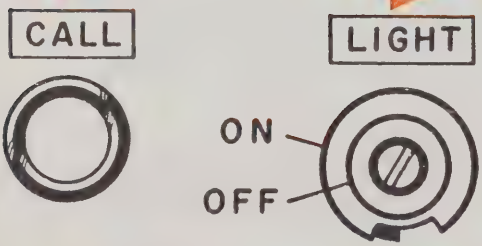
During SQUELCH operation, it lights to indicate that a singal is being received.

BUT

You must have the SQUELCH control set to NEW ON or OLD ON.

AND

the LIGHT switch to ON.



LIGHT switch.

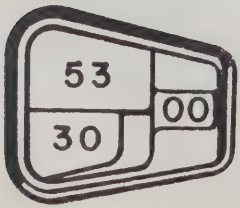
Controls power to DIAL WINDOW LAMP

AND

to squelch CALL lamp.

DAIL WINDOW LAMP

Contains the lamp to light up the DIAL WINDOW.



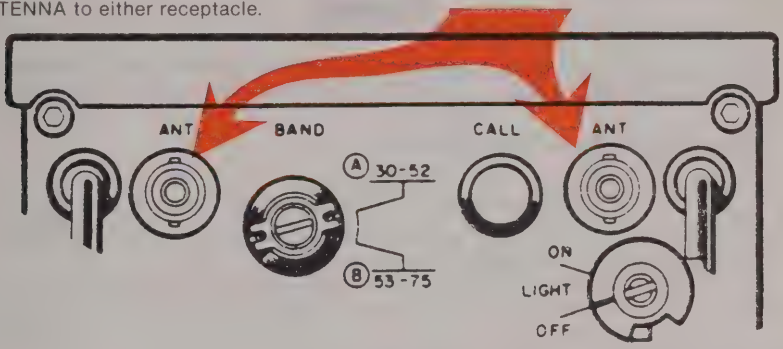
NOTE

The lamp will light only if you have the LIGHT switch at ON.

2-27. ANTENNA RECEPTACLES ON AUX RECEIVER (R-442(*)/VRC)

There are 2 ANT receptacles on each AUX RECEIVER.

They are connected in PARALLEL. This allows you to connect your AUX RECEIVER ANTENNA to either receptacle.

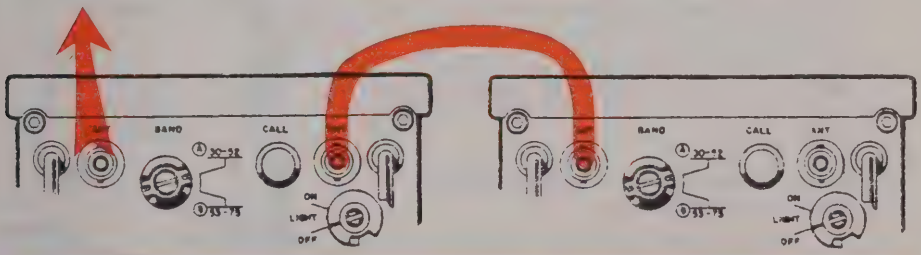


If you have 2 AUX RECEIVERS in your vehicle, they will usually share the same AUX RECEIVER ANTENNA.

The 2 AUX RECEIVERS may be connected as shown below.

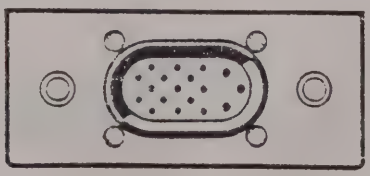
AUX RECEIVER ANTENNA

INTERCONNECTING CABLE



2-28. POWER/AUDIO RECEPTACLE ON AUX RECEIVER (R-442(*)/VRC)

Plugs into the receptacle loacted on the AUX receiver mount. This is the main channel for AUX receiver power and for the passage of AUX receiver signals to equipment cabled to the underside of the AUX receiver mount.



2-29. R-T X-MODE - NORMAL SWITCH

Every R-T and AUX RECEIVER has an X-MODE - NORMAL switch inside the radio.

CAUTION

An operator is NOT allowed to open any R-T or AUX RECEIVER to check or change the position of this switch.

This a job for C-E ORG MAINTENANCE.

BUT

You should know that there is such a switch inside every R-T and AUX RECEIVER and how this switch affects your communications.

Position of the X-MODE - NORMAL switch inside your R-T.

FOR ALL COMMUNICATIONS, THE SWITCH IS LEFT IN

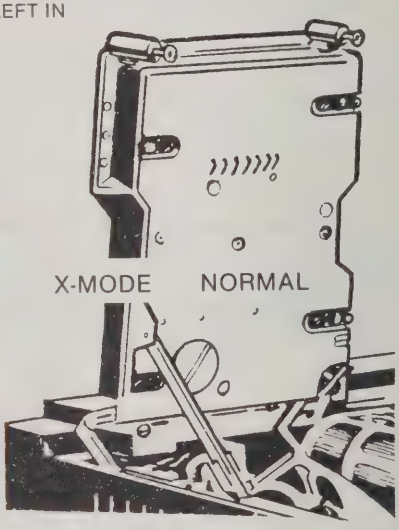
X-MODE

AND

- When no VINSON or NESTOR cables are connected to your R-T X-MODE receptacle, you can only communicate in PLAIN (not secure).

BUT

Your X-MODE cover on the R-T X-MODE receptacle must be tightly screwed on.



NOTE

The X-MODE cover has wiring which allows your R-T to operate PLAIN (NORMAL) when VINSON or NESTOR cables are NOT connected to your R-T X-MODE receptacle.

- When you have VINSON or NESTOR COMSEC equipment connected to your R-T through the X-MODE receptacle, you can communicate PLAIN (not secure/NORMAL)

OR

CIPHER (secure/X-MODE)

by using the controls on the VINSON or NESTOR COMSEC equipment. You do not have to disconnect cables, or open up the R-T or screw on the X-MODE cover.

2-30. AUX RECEIVER X-MODE - NORMAL SWITCH

Position of the X-MODE - NORMAL switch inside your AUX RECEIVER.

- When any AUX RECEIVER is installed on a VINSON AUX RECEIVER MOUNT:

  The internal X-MODE - NORMAL switch must be in the X-MODE position.

- When any AUX RECEIVER is installed on a regular AUX RECEIVER MOUNT:

  The internal X-MODE - NORMAL switch must be in the NORMAL position.

CAUTION

REMEMBER, YOU ARE NOT AUTHORIZED TO OPEN AN AUX RECEIVER TO CHECK OR CHANGE THE POSITION OF THE SWITCH.

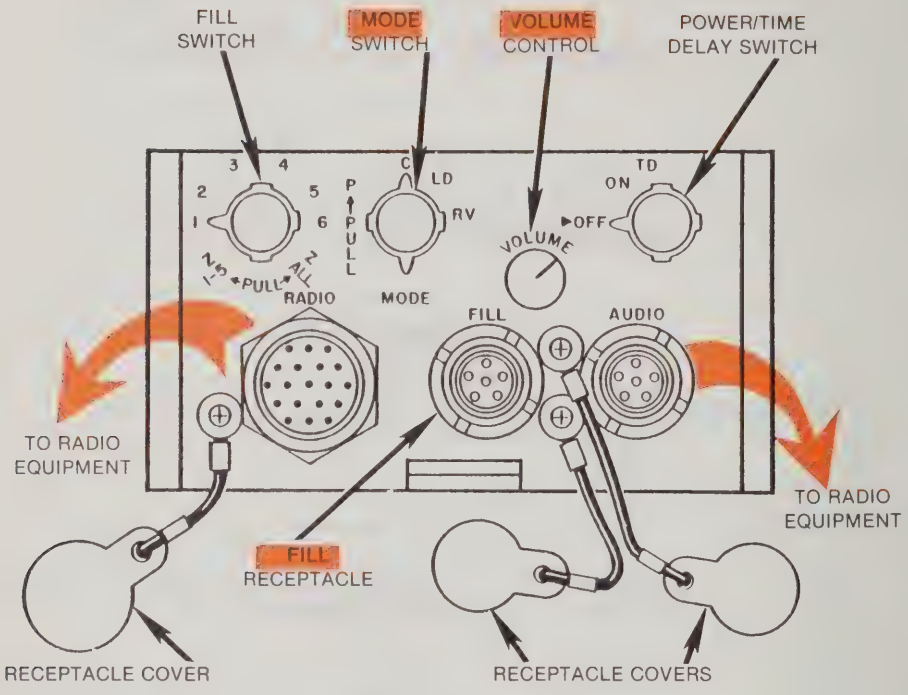
THIS IS A JOB FOR C-E ORG MAINTENANCE.

- Before you start on a mission, have C-E ORG MAINT check your R-T's and AUX RECEIVER for the proper position of the internal X-MODE - NORMAL switch.

AND

Tag each R-T and AUX RECEIVER to indicate the position of the switch.

2-31. OPERATOR'S CONTROLS AND RECEPTACLES ON VINSON COMSEC EQUIPMENT (TSEC/KY-57)



● RECEPTACLES

RADIO and AUDIO receptacles are connected by cables to the radio equipment.

FILL receptacle is used with special equipment to load/change the VINSON "scrambling" circuits.

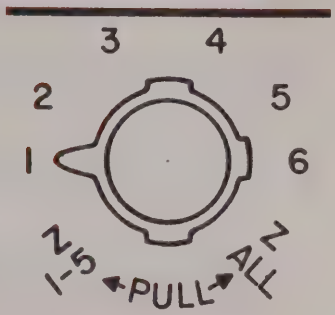
NOTE

When cables are removed from any of the three receptacles, cover the receptacle with its cover.

2-31. OPERATOR'S CONTROLS AND RECEPTACLES ON VINSON COMSEC EQUIPMENT (TSEC/KY-57) - Continued

- Fill switch.

  Selects the desired scrambling circuits in the VINSON equipment.



- **MODE** switch.

  Has 4 positions.

  P for plain (not secure) communications through the radio equipment.

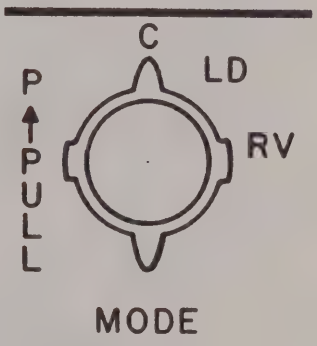
  C for CIPHER (secure) communications through the radio equipment.

  NOTE

  You can receive PLAIN (not secure) signals in the **C** position.

  LD used when loading the VINSON scrambler circuits.

  RV used for special secure operations.



- **VOLUME** control.

  May be used with the other volume controls on the radio and intercom equipment.

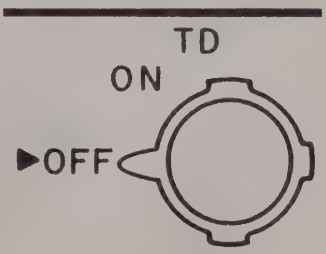
- POWER/TIME DELAY SWITCH.

  Has 3 positions.

  ON applies power to VINSON equipment.

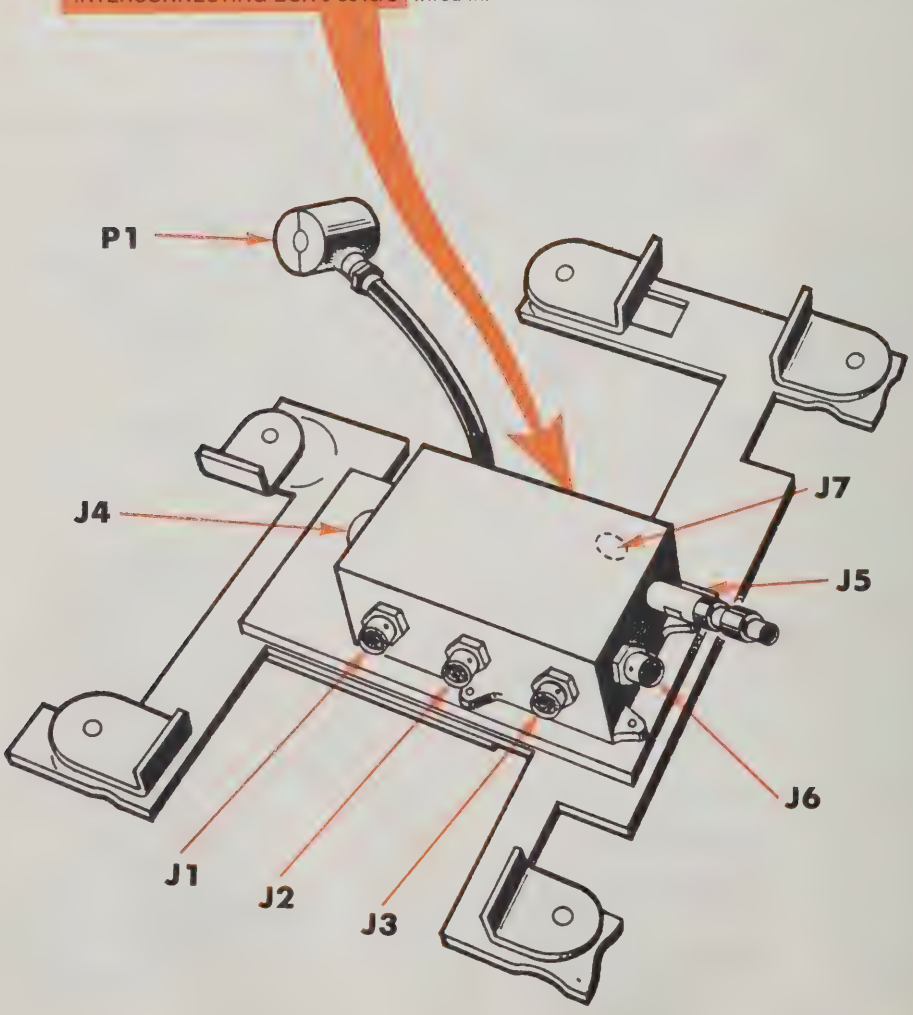
  OFF removes power.

  TD provides time delay operation.



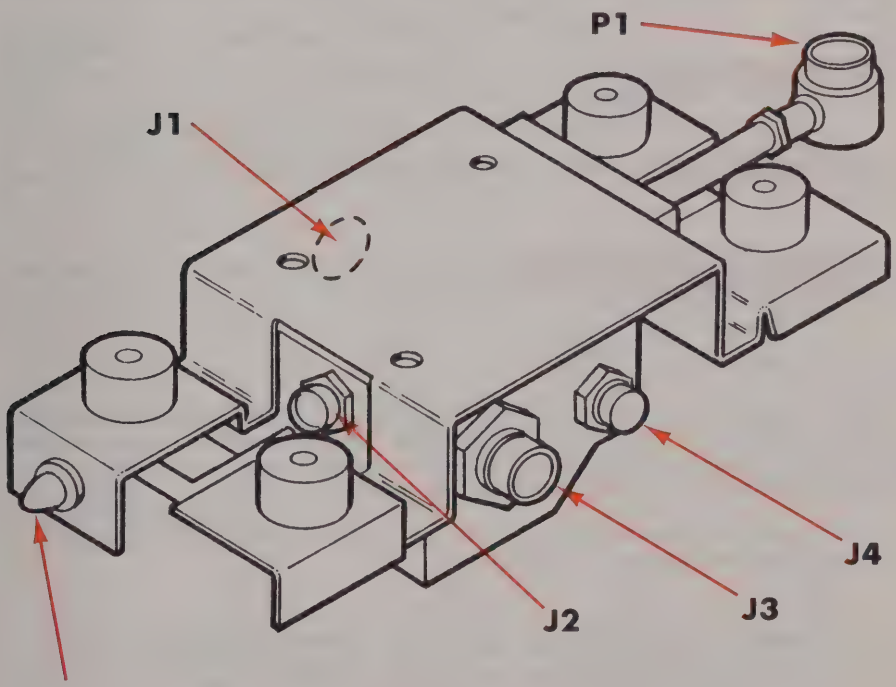
2-32. RECEPTACLES ON VINSON R-T MOUNT

- It may be necessary to make as many as 7 cable connections to INTERCONNECTING BOX J-3513/U.
- The exact number of connections and the types of cables are described in SECTION IV, CABLING.
- Remember, a VINSON R-T MOUNT is a regular R-T MOUNT (MT-1098/VRC) which has INTERCONNECTING BOX J-3513/U wired-in.



2-33. CONTROLS AND RECEPTACLES ON VINSON AUX RECEIVER MOUNT

- It may be necessary to make as many as 5 cable connections to INTERCONNECTING BOX J-3514/U.
- The exact number of connections and the types of cables are shown in SECTION IV, CABLING.
- Remember, a VINSON AUX RECEIVER MOUNT is a regular AUX RECEIVER MOUNT (MT-1898/VRC) which has INTERCONNECTING BOX J-3514/U wired-in.



- The PUSH-TO-TALK ALARM CLEAR SWITCH is used by the operator during the setup of the VINSON COMSEC equipment.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-34. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS).

BEFORE OPERATION, perform your B PMCS to be sure that your equipment is ready to go.

DURING OPERATION, perform your D PMCS. This should help you spot small problems; before they become big problems.

AFTER OPERATION, perform your A PMCS. This should help keep your equipment in top shape.

WEEKLY AND MONTHLY PMCS are important checks you make to keep serious problems from suddenly happening.

ROUTINE CHECKS like:

CLEANING, DUSTING, WASHING, CHECKING FOR FRAYED CABLES, STOWING ITEMS NOT IN USE, COVERING UNUSED RECEPTACLES AND CHECKING FOR LOOSE NUTS AND BOLTS are not listed as PMCS checks. They are things that you should do anytime you see they must be done.

If you find a routine check like one of those above is listed your PMCS, it was listed because other operators reported problems with this item.

WHEN YOU ARE DOING ANY PMCS OR ROUTINE CHECKS, KEEP IN MIND THE WARNINGS AND **CAUTIONS.**

NOTE

The PROCEDURES column in your PMCS chart instructs you to "CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY." Carefully follow these instructions, and remember, YOU are NOT authorized to open up any radio to make adjustments or PMCS.

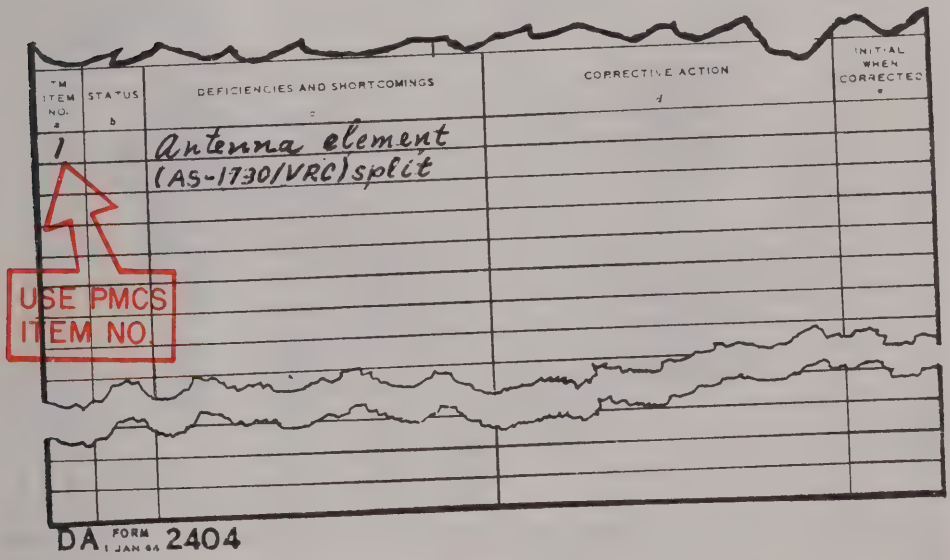
2-35. USE OF DA FORM 2404 WITH PMCS

NOTE

If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down.

NOTE

Use the ITEM NO. column in your PMCS table to get the numbers for the TM ITEM NO. column on DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when you fill out the form.



NOTE

The heading and other columns on DA Form 2404 should be filled out following the instructions in TM 38-750, The Army Maintenance Management System (TAMMS) and the special instructions from your commander.

CAUTION

REMEMBER: Call C-E ORG MAINTENANCE if you find loose nuts and bolts or any defects in your radios, antennas or control boxes.

NOTE

The PMCS and the criteria for READINESS REPORTING replace Equipment Serviceability Criteria (ESC). Do your PMCS carefully.

TABLE 2-1. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

NOTE: THE CHECKS IN THE "INTERVAL" COLUMN ARE TO BE PERFORMED IN THE ORDER LISTED.

B-BEFORE OPERATION
D-DURING OPERATION
A-AFTER OPERATION
W-WEEKLY
M-MONTHLY

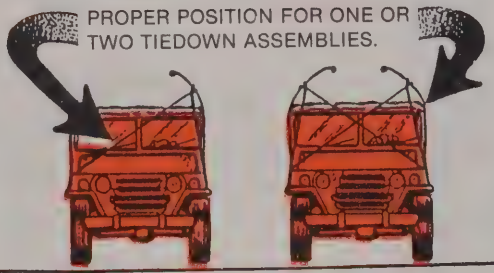
ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						ALL ANTENNA SYSTEMS	**WARNING** DO NOT TRANSMIT ON THE RADIO WHILE HANDLING THE ANTENNA.	
1	✸					Elements	Check to see that elements are not split and make sure they have not been shortened. Replace defective elements.	ANY ANTENNA ELEMENT IS SPLIT OR SHORTENED 6 OR MORE INCHES.
2						Element Threads	Clean and lubricate threads . (Use Silicone Compound MIL-S-8660.)	THREADS ARE STRIPPED.
3	✸					Tip Cap (if authorized)	Check to see that the tip is in place on the top section, and securely taped in place.	
✪ 4	✸					Tiedown (if authorized)	Check to see that the tiedown assembly rope is connected to the proper place on your vehicle and adjusted to properly hold down the antenna.	

✪ Because these radio sets are used with many different vehicles, this manual cannot give you a standard place to tie the tiedown ropes. Your organization should have a SOP covering specific tie-down procedures.

PROPER POSITIONING PERMITS SAFE RELEASE IF ANTENNA HITS SOMETHING.

Remember, radio range is reduced when antennas are tiedown.

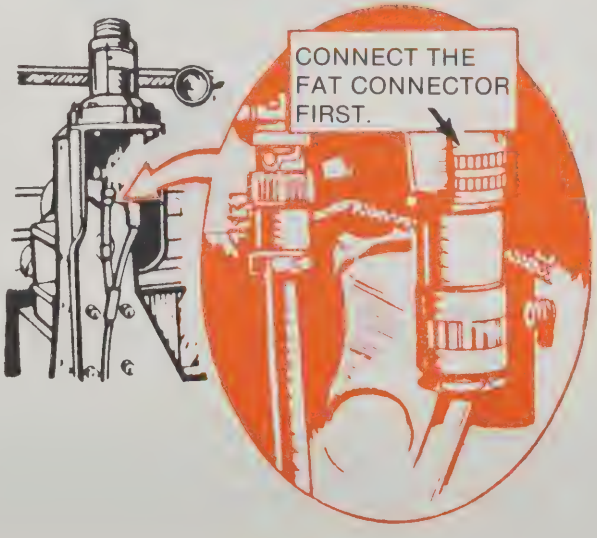
PROPER POSITION FOR ONE OR TWO TIEDOWN ASSEMBLIES.



CAUTION

When pulling the antenna down, make sure that the tip is above any person and that it will not swing beyond the side of the vehicle.

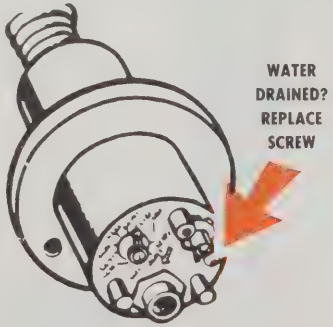
TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
5	✸					Cable Connector Pins	ALL CABLE CONNECTOR PINS ARE STRAIGHT. All cable connectors are properly keyed in their antenna base receptacle. All connectors are firmly in place. When installing connectors.  	THE THIN CONNECTOR CANNOT BE CONNECTED TO THE BASE OF THE R-T ANTENNA MATCHING UNIT.

		CONNECTIONS AT R-T ANTENNAS		
6	✸	Ground Strap	Ground strap is securely connected.	
7	✸	Element Contacts	Make sure that the contact sticks out from the top of the spring section and that the contact is not loose and O-ring is in place.	CONTACT IS MISSING OR DOES NOT STICK OUT.
8	✸	Safety Wire	Make sure safety wire is connected between the bottom antenna element and spring section.	

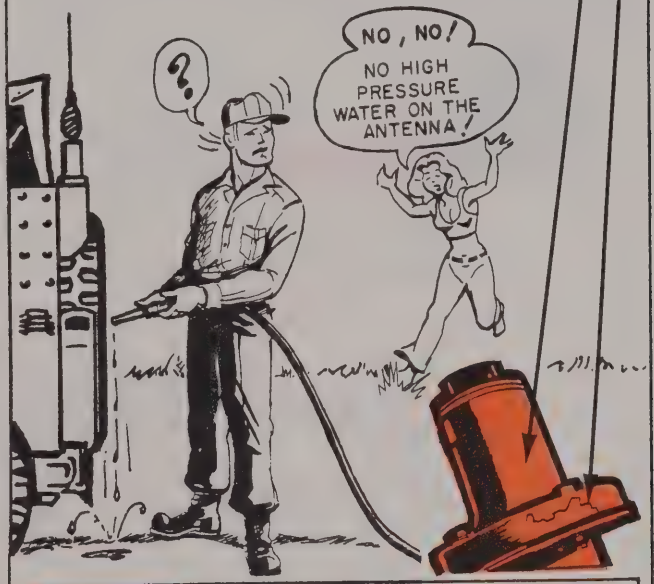
TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						R-T ANTENNA MATCHING UNITS		
✪ 9					✸	Water Drain (on COMPACT and ROUND BASE ANTENNA MATCHING UNITS)	Drain all water trapped inside the mount.	



✪ DO THIS STEP AS SOON AS POSSIBLE AFTER FORDING OPERATIONS. ALSO WHEN YOU SUSPECT WATER MAY HAVE REACHED THE ANTENNA MATCHING UNIT.

10	✸						Housing (ALL)	Is it securely bolted? Report any loose or missing bolts and washers. Check for proper kit of steel reinforcing ring (if used). Check for softening caused by painting or solvents. CLEAN WITH CLEAR WATER AND A RAG ONLY.	



CAUTION: DO NOT USE WATER UNDER PRESSURE, DO NOT USE TRICHLOROTRIFLUOROETHANE, AND DO NOT PAINT.

TABLE 2-1. PMCS - (Continued)

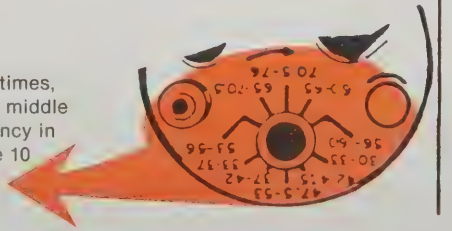
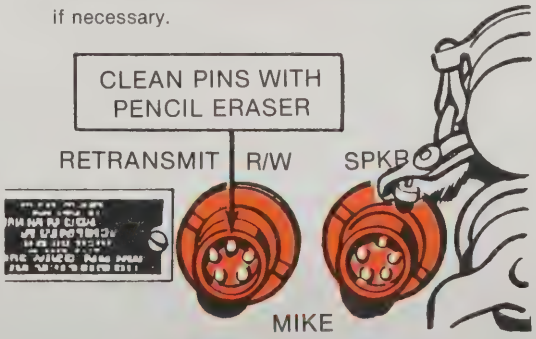
ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
11					✸	Tuning mechanism inside COMPACT ANTENNA MATCHING UNIT (MX-9146/GRC) or ROUND BASE ANTENNA MATCHING UNIT (MK-6707/VRC) or BOX BASE ANTENNA MATCHING UNIT (MX-2799/VRC).	Make sure that the electrical-mechanical circuits inside the antenna matching units automatically work when you change from one group of frequencyes to another group of frequencies. Start by selecting a test frequency in the middle of the first group of frequencies (30 mHz to 33 mHz) and tune the R-T to the test frequency. **NOTE** Your R-T should be ON but you do not have to key the R-T. While turning the R-T, have someone **listen** carefuly at the side of the antenna matching unit for the sounds of the electrical-mechanical actions. Do this 10 times, tuning to a middle test frequency in each of the 10 groups. 	On Antenna Matching Unit MX-2799/VRC. the electrical-mechanical sounds cannot be heard as you go through every one of the 10 test frequency tuning steps. OR On Antenna Matching Unit MX-9146/GRC and Antenna Matching Unit MX-6707/VRC, the electrical-mechanical sounds cannot be heard as you go through every one of the 10 test frequency tuning steps, **AND** you cannot change the circuits by turning the control at the bottom of the antenna matching unit because the control is broken or it cannot be reached.

TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL QUARTERLY	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
12	✸	R-T OUPUT POWER AND MATCHING UNIT	You must check with C-E ORG MAINT once during each quarter to make sure they have used Test Set AN/URM-182 to verify that you have sufficient power output from your R-T and that your antenna is properly matched to the R-T. Power matching will get you maximum radiated power from the antenna connected to the R-T.	C-E ORG MAINT is not available or able to do the necessary tests.

TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						AUDIO ACCESSORIES		
13	✸					O-Rings	Audio connectors have a good O-Ring.	
14					✸	Lubrication	O-Ring has a light coat of silicon compound. Use MIL-M-8660.	
15	✸					Moisture Barriers	If used, moisture barriers are in place.	
16					✸	Pins on ALL Receptacles and Connectors	Check for corrosion. Clean with pencil eraser if necessary.  Report missing or damaged pins to C-E ORG MAINT.	

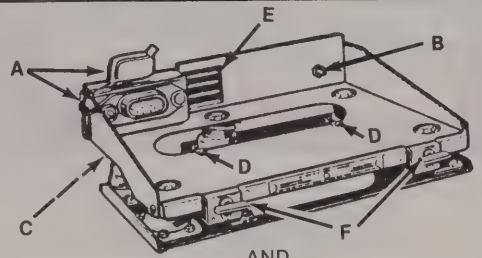
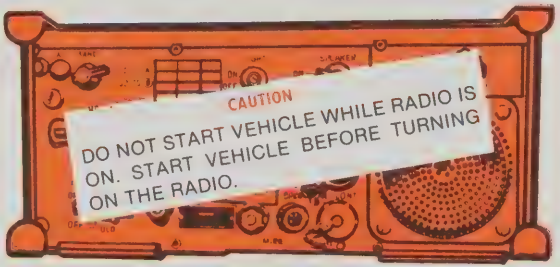
17	✸	ALL R-T and AUX RECEIVER MOUNTS	Connections	**CAUTION** BEFORE REMOVING OR INSTALLING ANY RADIO EQUIP MENT, MAKE SURE THAT ALL RADIO AND INTERCOM POWER SWITCHES ARE OFF. Before installing an R-T or AUX RECEIVER on its mount, make sure that: **A** Receptacle cover is removed and chain is not caught between guide pin and receptacle. **B** Both mount guide pins are straight. **C** Unused underside receptacles are covered. **D** Grounding straps are securely connected between top tray and mount base. **E** Vent port area is free of obstructions. **CAUTION** ON EARLY MODEL R-T MOUNTS, A SPECIAL VENT COVER IS PROVIDED. THIS VENT COVER MUST BE INSTALLED WHEN SET IS IN OPERATION.  AND **F** After the R-T or AUX RECEIVER is installed, safety wire the clamp(s).	R-T CANNOT BE SECURELY CLAMPED IN ITS MOUNT.

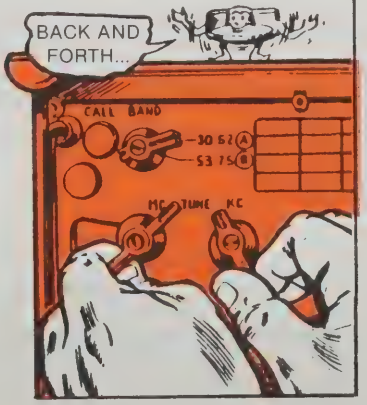
TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						R-T AND AUX RECEIVER	✪ BECAUSE RADIO RANGE IS AFFECTED BY TERRAIN, WEATHER, ANTENNA TYPES AND MANY OTHER CONDITIONS, THESE CHECKS SHOULD BE DONE OVER A DISTANCE AND UNDER CONDITIONS SELECTED BY YOUR COMMUNICATION'S SUPERVISOR.	
✪ 18	✸					BASIC OPERATION (OVER A DISTANCE)	During normal operation: "KEY THE RADIO" and talk to the distant radio station. During transmission you should hear: sidetone (your voice) and the blower running. During reception, you should hear the distant station. Setup the desired SQUELCH operation with the distant station, and verify CALL lamp operation.	When using the R-T: You cannot hear sidetone or the blower running, or the distant station cannot hear you. or the cover for the X-MODE receptacle is missing. When using the AUX RECEIVER: You cannot hear the distant station (if mission requires the AUX RECEIVER be available to monitor a specific frequency at all times).



✪ 19	✸					Radio Relay Operation with RADIO RELAY (C-2299/VRC) Connected to the R-T	With audio accessories connected to the RADIO RELAY BOX: Communicate with the distant station. During transmission, you should hear sidetone and the blower running. During reception, you should hear the distant station. Communicate with both terminals and coordinate switching over to radio relay operation. NEXT Place the RETRANS switch on the RADIO RELAY BOX to ON . Both terminals should now communicate through your equipment.	Distant station cannot hear you or you cannot hear sidetone or the blower running. You cannot hear the distant station. Retransmission is not satisfactory in both directions.
20	✸					Pushbutton Operation (RT-246(*)/VRC Only.)	With pushbuttons preset to assigned frequencies, establish communications with a distant station on each pushbutton channel. Check out normal transmission, reception and SQUELCH operation on each pushbutton channel.	

TABLE 2-1. PMCS - (Continued)

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
21	✸					R-T Operation and REMOTE BOX Connected to the PUSHBUTTON R-T	With satisfactory pushbutton operation and REMOTE CONTROL BOX connected to the R-T: Check out each setting of the PWR SW on the REMOTE CONTROL BOX. Check out the CHAN SEL switch on the REMOTE CONTROL BOX for all 10 pushbutton channels. If REMOTE CONTROL BOXES are in TANDEM, check out each SW and CONTROL indicator to enable one box to get control from the other.	
22					✸	R-T and AUX RECEIVER Turner Contacts	To prevent corrosion buildup on the turner contacts, turn the turner knobs back and forth several times. If you have an AUX receiver, do the same to its turner knobs. 	

			VEHICLE BATTERY COMPARTMENT		
✪	23	✸	Cables and Terminals	Check to see that the: Battery terminals are not corroded. Radio power cable lugs are securely connected to the battery. Radio power cable leads are tagged. **CHECK WITH FINGERS** **not** vise-grips or pliers. 	

✪ Your vehicle commander may direct that this step be done differently and/or at a different time.

TABLE 2-1. PMCS - (Continued)

ITEM NO.	✸ INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
						CRITICAL SUPPORT BY C-E ORG MAINT		
24					✸	URGENT MWO	You must check with C-E ORG MAINT once a month to make sure that all URGENT MODIFICATION WORK ORDERS (MWO's) have been done to all of your radio equipment.	C-E ORG MAINT TELLS YOU THAT ONE OR MORE URGENT MWO's HAVE NOT BEEN DONE TO YOUR EQUIPMENT.
✪ 25						Links in R-T MOUNTS and AUX RECEIVER MOUNTS	Whenever C-E ORG MAINT works on or replaces any R-T MOUNT or AUX RECEIVER MOUNT, check with them to make sure the links inside the mount are properly connected.	
✪ 26						Internal X- MODE Switches	Whenever C-E ORG MAINT replaces any R-T or AUX RECEIVER, check with them to make sure the internal X-MODE switch in each radio is set to the proper position.	
✪ 27						R-T Cooling	After you have operated your R-T in a dusty area, ask C-E ORG MAINT to check and clean, if necessary, the vanes and squirrel cage fins of your R-T's blower. They are located inside the R-T.	

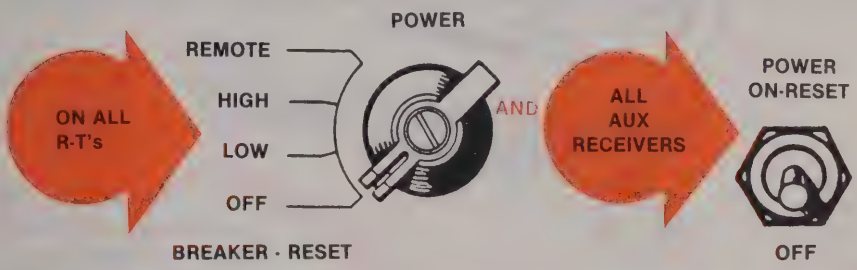
✪ The interval for these items varies and they should be done as stated in the PROCEDURES column.

Section III. INSTALLATION, ASSEMBLY AND DISASSEMBLY OF MAJOR ITEMS

2-36. GENERAL

CAUTION

POWER OFF when installating or removing any radio or antenna.



WARNING

The receiver-transmitters are compact and heavy (over 50 pounds). Be careful when handling them in order to protect personnel from serious injury and the equipment from damage.

CAUTION

When pulling any R-T from an R-T MOUNT, carefully grasp both guards (or handles) to pull the unit from the radio mount, and continue to use both hands to lift and carry the unit. NEVER CARRY OR LIFT THE RECEIVER-TRANSMITTER BY ONLY ONE OF THE GUARDS (OR HANDLES).

CAUTION

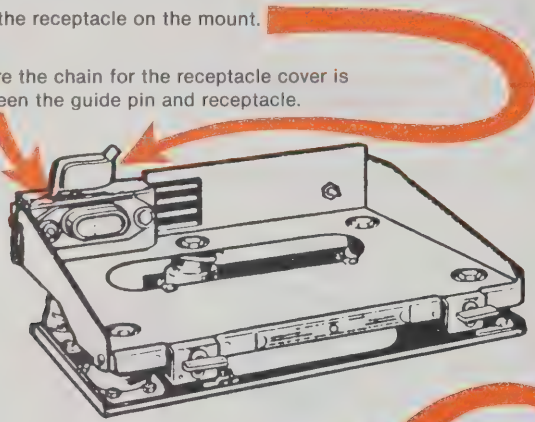
Do not lay the R-T on its back. This may damage the blower assembly. Lay it on one side.

2-37. R-T AND AUX RECEIVER INSTALLATION

A Before placing the radio on the mount, clean the mount.

B Uncover the receptacle on the mount.

C Make sure the chain for the receptacle cover is not between the guide pin and receptacle.



D Make sure the pins on the back of the radio are straight.

E Lift the radio onto the mount and carefully push it straight back to seat the radio pins into the mount receptacle.

F Tighten the mount clamp(s) to lock the radio on the mount. Install safety wire to keep clamps from loosening.

G Connect cable assemblies to the radio and mount as shown on the cabling diagram.

2-38. REMOVING R-T AND AUX RECEIVER

A Disconnect all cables connected to the radio's front panel.

B Remove safety wire and loosen clamps.

C Carefully remove radio from its mount. (Pull it straight back.)

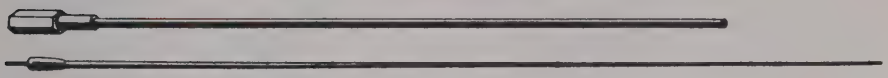
D Cover or cap all receptacles.

2-39. INSTALLATION OF ANTENNA ELEMENTS ON ROUND BASE ANTENNA (AS-1729/VRC) OR BOX BASE ANTENNA (AT-912/VRC)

A Apply a light coat of Silicone Compound (MIL-S-8660) to the threads on the antenna elements.

CAUTION

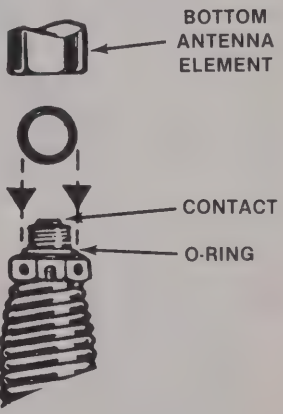
DO NOT USE GRAPHITE GREASE.



B Screw the two antenna elements together.

If they are loose, wrap a few turns of electrical insulation tape around the joint.

C Screw the bottom section into the top of the spring section on the mount.



CAUTION

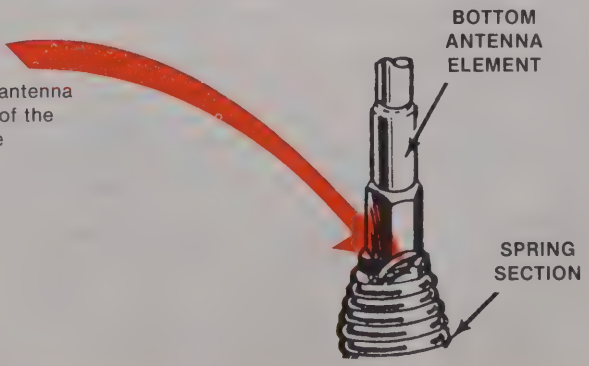
Be sure that the contact on the top of the spring section is not loose and that it sticks out from the top of the spring section.

IF YOU HAVE ANY PROBLEMS WITH THE CONTACT, NOTIFY C-E ORG MAINT.

ALSO

Be sure the O-ring is in place before you screw on the bottom antenna element.

D Install a safety wire between the bottom antenna element and the top of the spring section on the mount.



2-40. INSTALLATION OF ANTENNA ELEMENT ON COMPACT ANTENNA (AS-2731/GRC)

A Apply a light coat of Silicone Compound (MIL-S-8660) to the threads on the antenna element.

CAUTION DO NOT USE GRAPHITE GREASE.

B Screw the antenna element into the top of the spring section ON THE MOUNT.

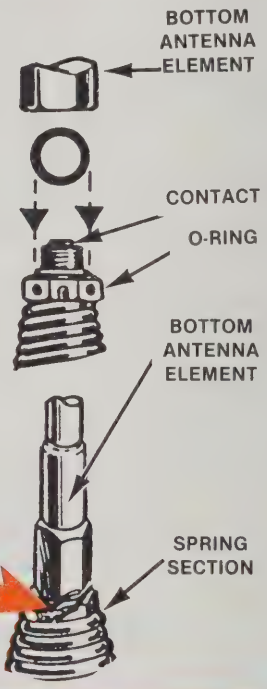
CAUTION

Be sure the contact on the top of the spring section is not loose and that it sticks out from the top of the spring section.

IF YOU HAVE ANY PROBLEMS WITH THE CONTACT, NOTIFY C-E ORG MAINT.

ALSO

Be sure the O-ring is in place before you screw on the antenna element.

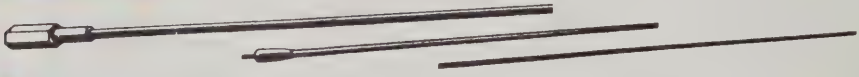


C Install a safety wire between the antenna element and the top of the spring section.

2-41. INSTALLATION OF ANTENNA ELEMENTS ON AUX RECEIVER RECEIVER ANTENNA MAST BASE (AB-588/GR)

A Apply a light coat of Silicone Compound (MIL-S-8660) to the threads on the antenna elements.

CAUTION DO NOT USE GRAPHITE GREASE.

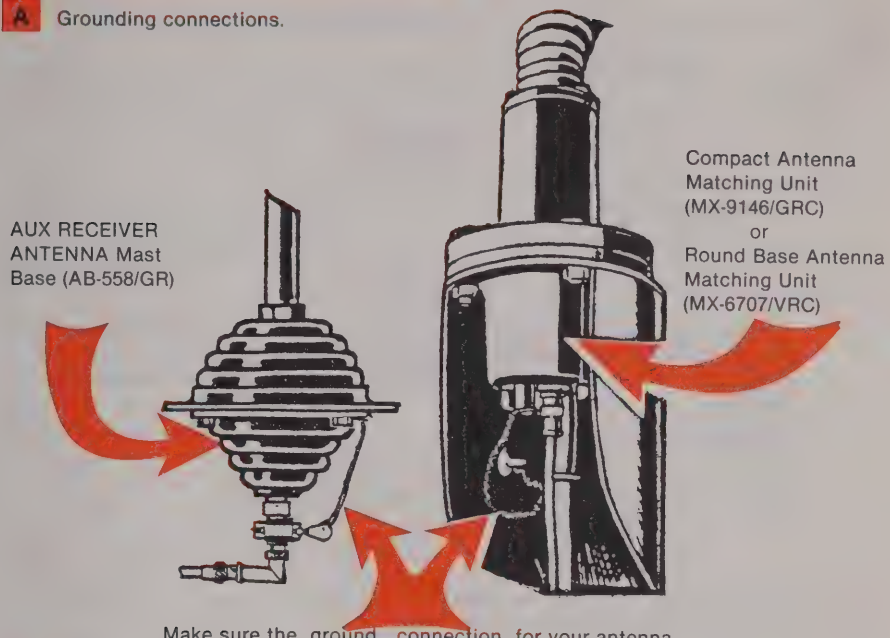


B Screw the antenna elements together. If they are loose, wrap a few turns of electrical insulation tape around the joint.

C Screw the bottom section into the top of the spring section.

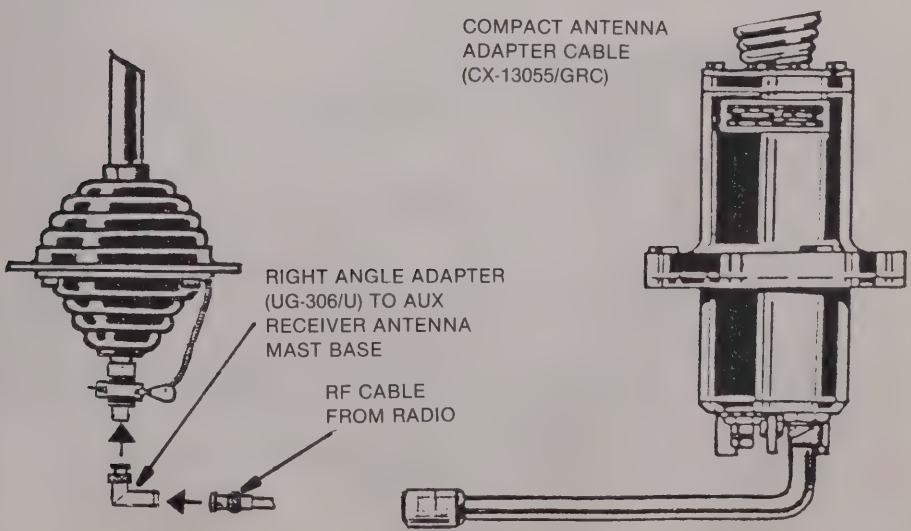
2-42. ANTENNA CONNECTIONS

A Grounding connections.



Make sure the ground connection for your antenna is securely connected. Report problems to C-E ORG MAINT.

B You may find adapter connections to some antennas.



2-43. WHIP ANTENNA TIEDOWN PROCEDURES

NOTE:

These procedures apply to all whip antennas with 2 or 3 antenna elements.

A Slide the V-shaped clamp of the tiedown assembly to the middle of the top antenna element.

CAUTION

Do not put the antenna element beneath the clamp. If you do, the antenna cannot be safely released.

CAUTION

Do not use the tiedown clamp that is supplied with some vehicles if the clamp will not permit the whip antenna to jump out of the clamp when the antenna hits something. ALSO · MAKE SURE the clamp does not cut into the fiberglass element.

PROPER TIE-DOWN CLAMP

B Pull the antenna down to approximately 45 to 60 degrees above the ground level and tie the tie-down rope(s) to the an approved place.

CAUTION

Do not tie the ropes just to any convenient place. Check with your supervisor on the procedure and location approved for your vehicle by your commander.

C Make sure the ANTENNA TIP CAP is firmly in place on the tip of the top antenna element. Use low temperature tape if necessary to tape the ANTENNA TIP CAP in place.

CAUTION

When 2 or more antennas are being tied down, make sure the antennas do not cross each other.

CAUTION

Double check your antennas after tiedown to make sure they do not stick out beyond the sides of the vehicle and that no person walking by the vehicle can be hit in the face by the tiedown antenna tip.

D Remember, radio range is decreased when you are operating with your antennas tied down.

2-44. DISASSEMBLY OF ALL WHIP ANTENNAS

A Remove the tiedown assembly (if used).

B Remove the safety wire (if used) from the bottom antenna element.

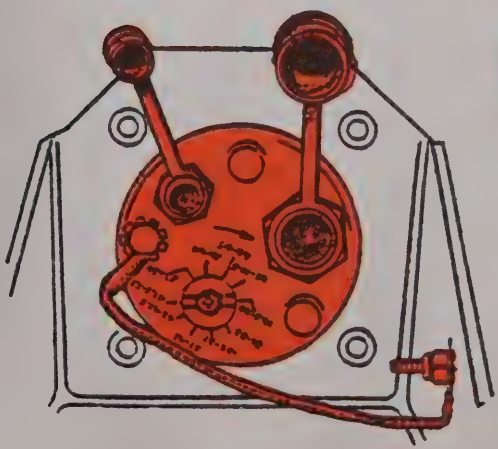
BUT

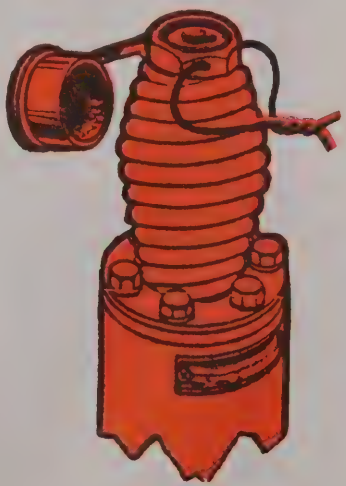
Leave the safety wire attached to the top of the spring section.

C Unscrew the antenna element(s).

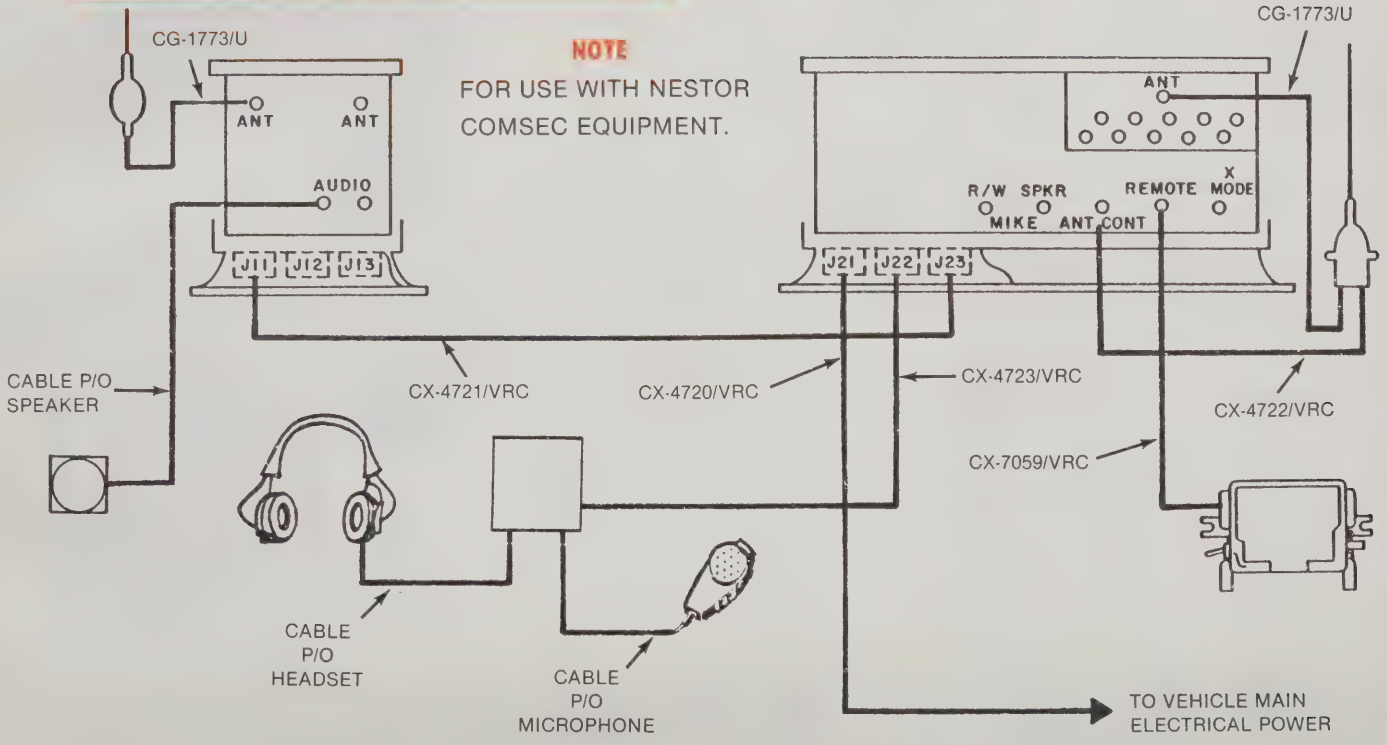
D Store the removed antenna element(s) and tiedown(s).

E Cover or cap all open receptacles.





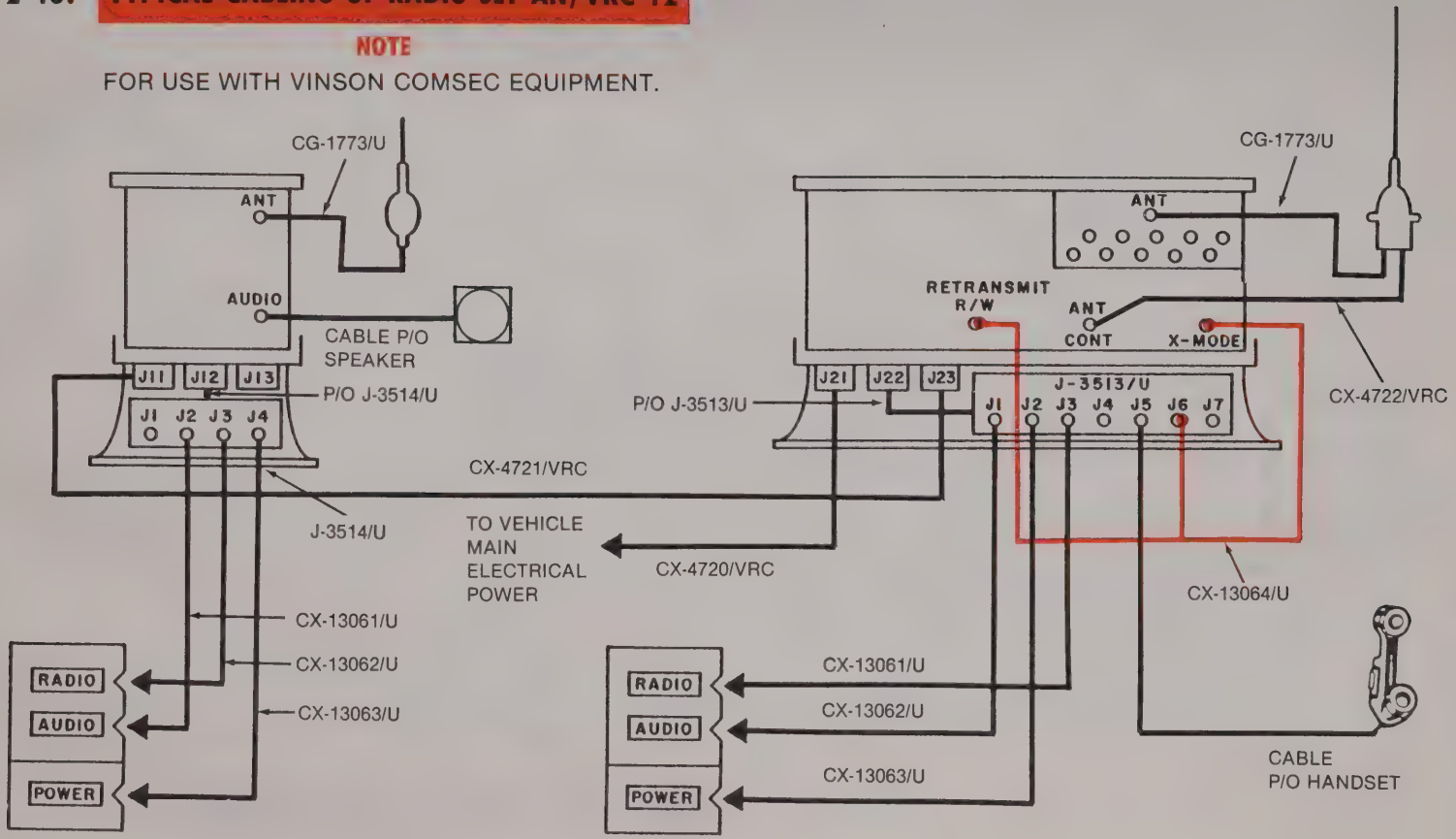
2-45. TYPICAL CABLING OF RADIO SET AN/VRC-12



2-46. TYPICAL CABLING OF RADIO SET AN/VRC-12

NOTE

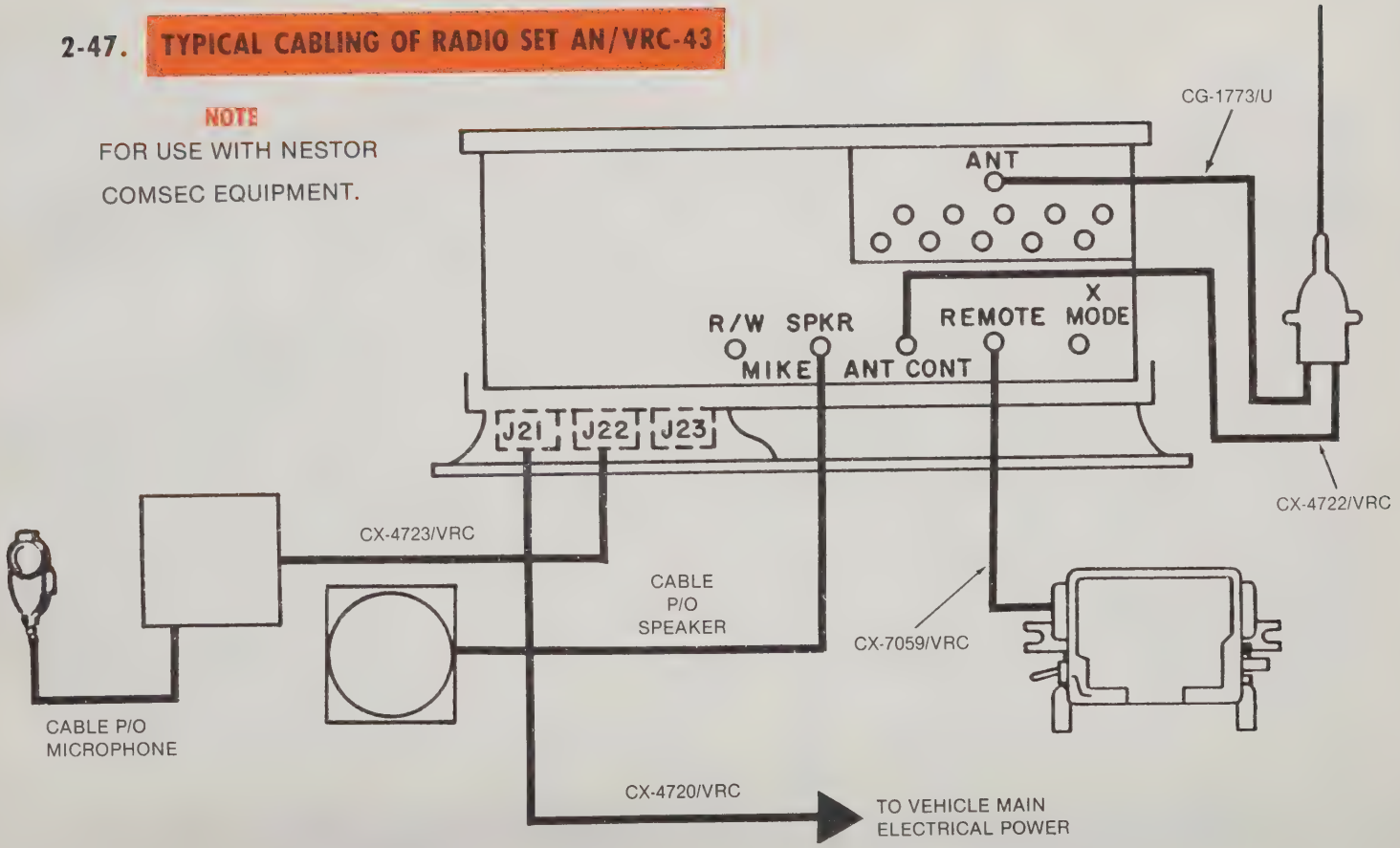
FOR USE WITH VINSON COMSEC EQUIPMENT.



2-47. TYPICAL CABLING OF RADIO SET AN/VRC-43

NOTE

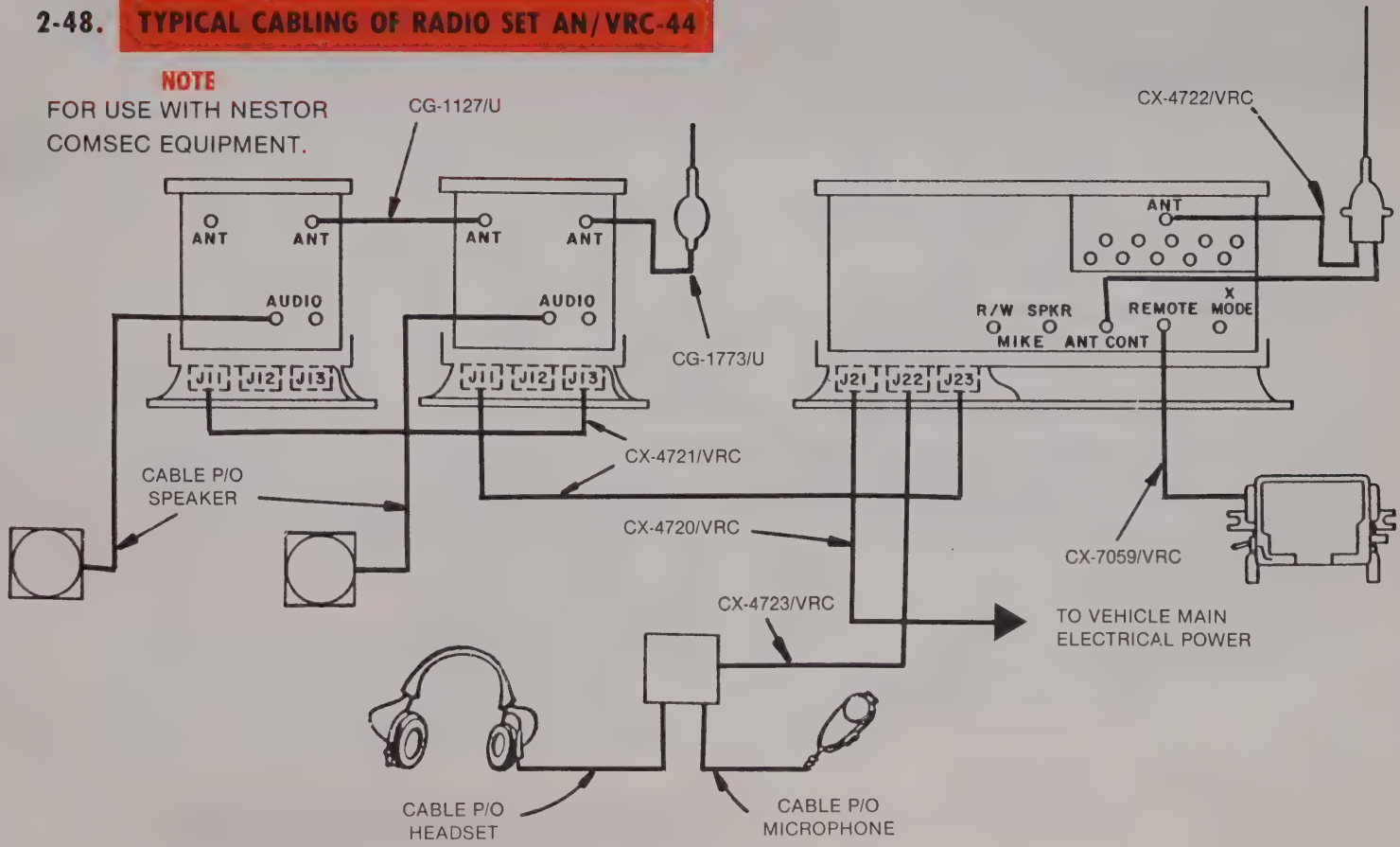
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-48. TYPICAL CABLING OF RADIO SET AN/VRC-44

NOTE

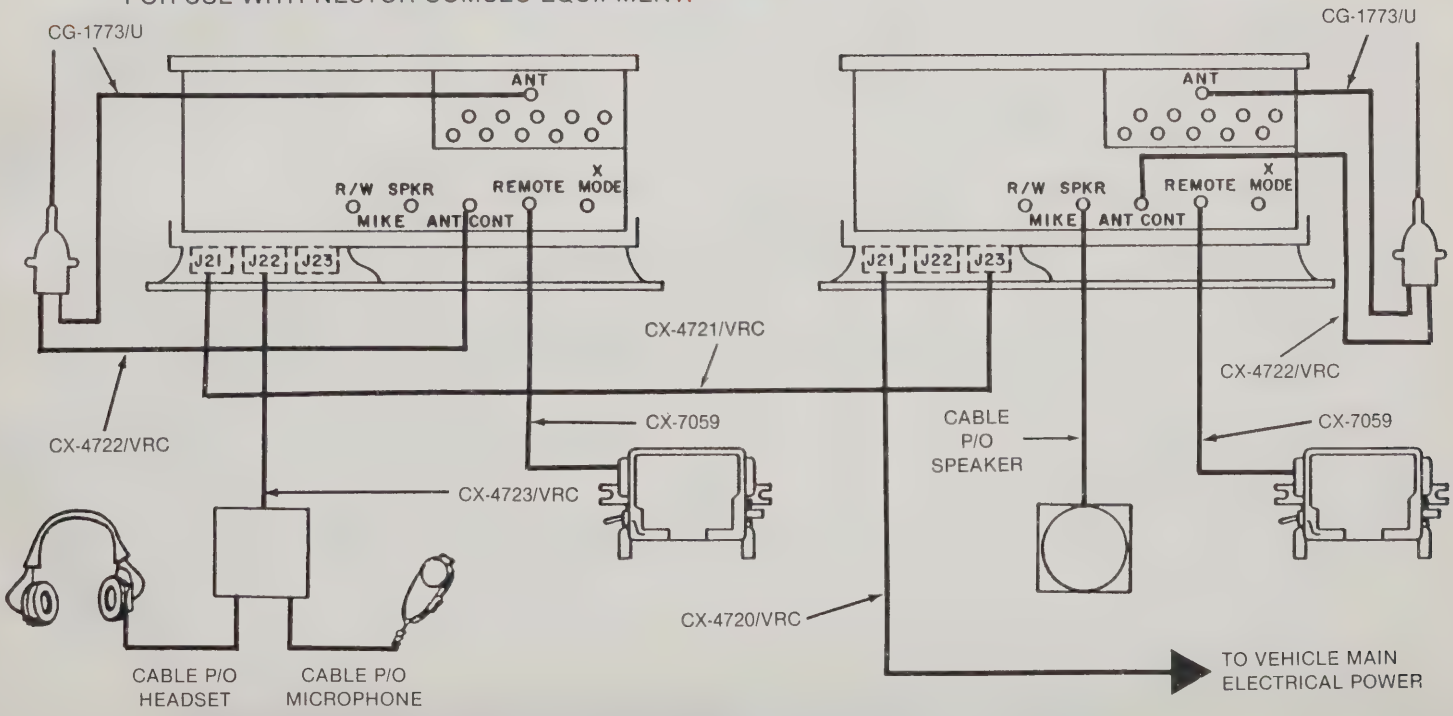
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-49. TYPICAL CABLING OF RADIO SET AN/VRC-45

NOTE

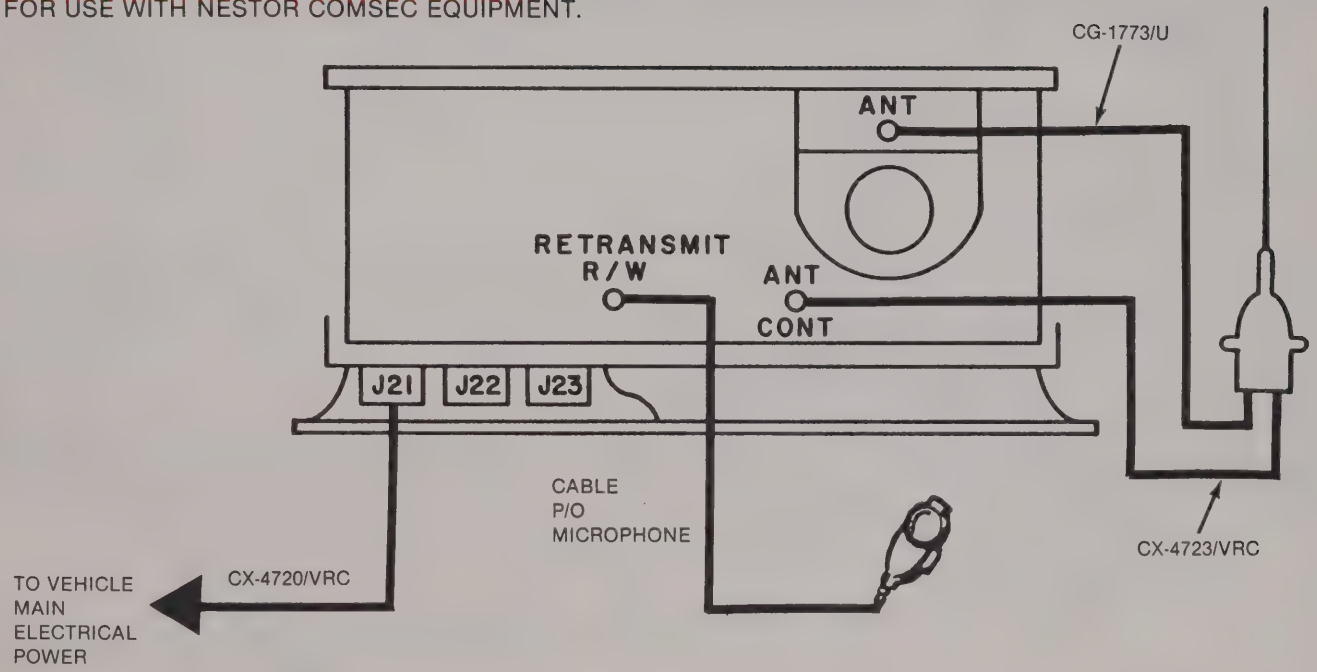
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-50. TYPICAL CABLING OF RADIO SET AN/VRC-46

NOTE

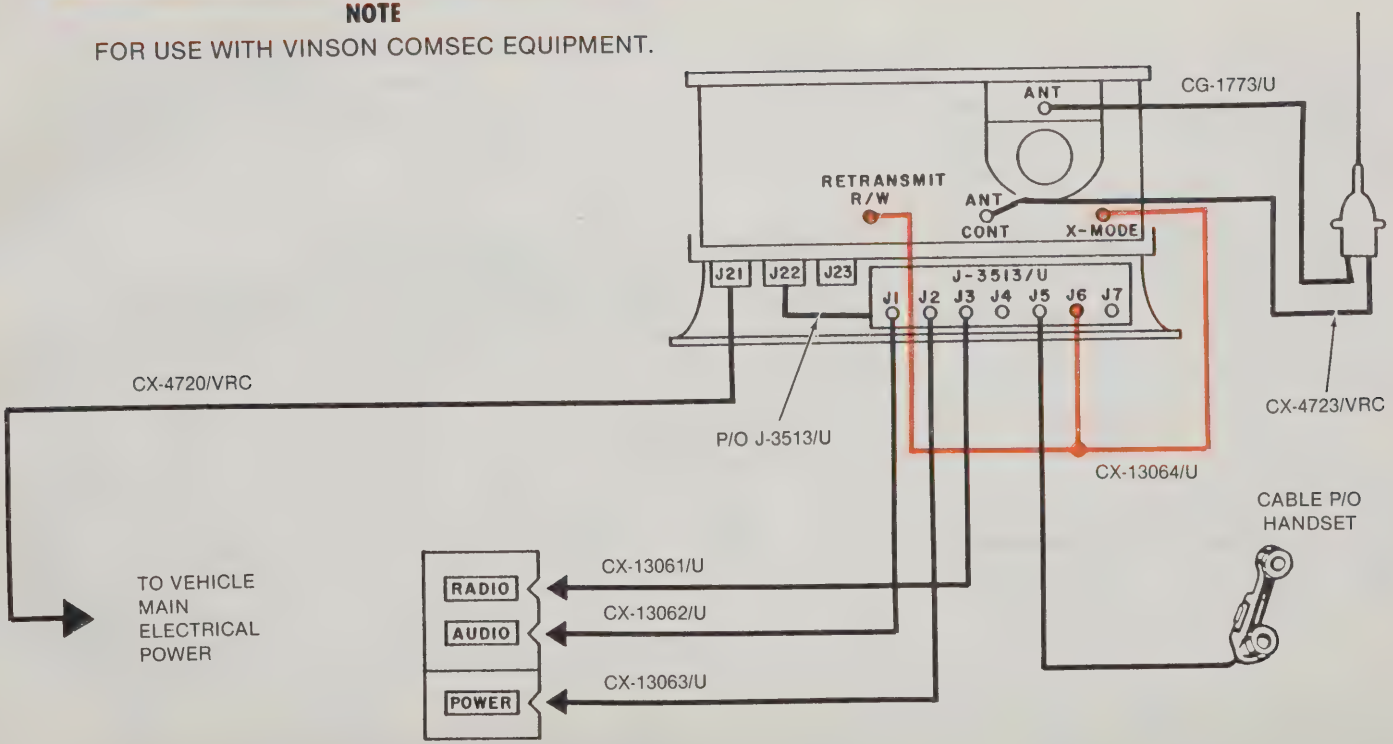
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-51. TYPICAL CABLING OF RADIO SET AN/VRC-46

NOTE

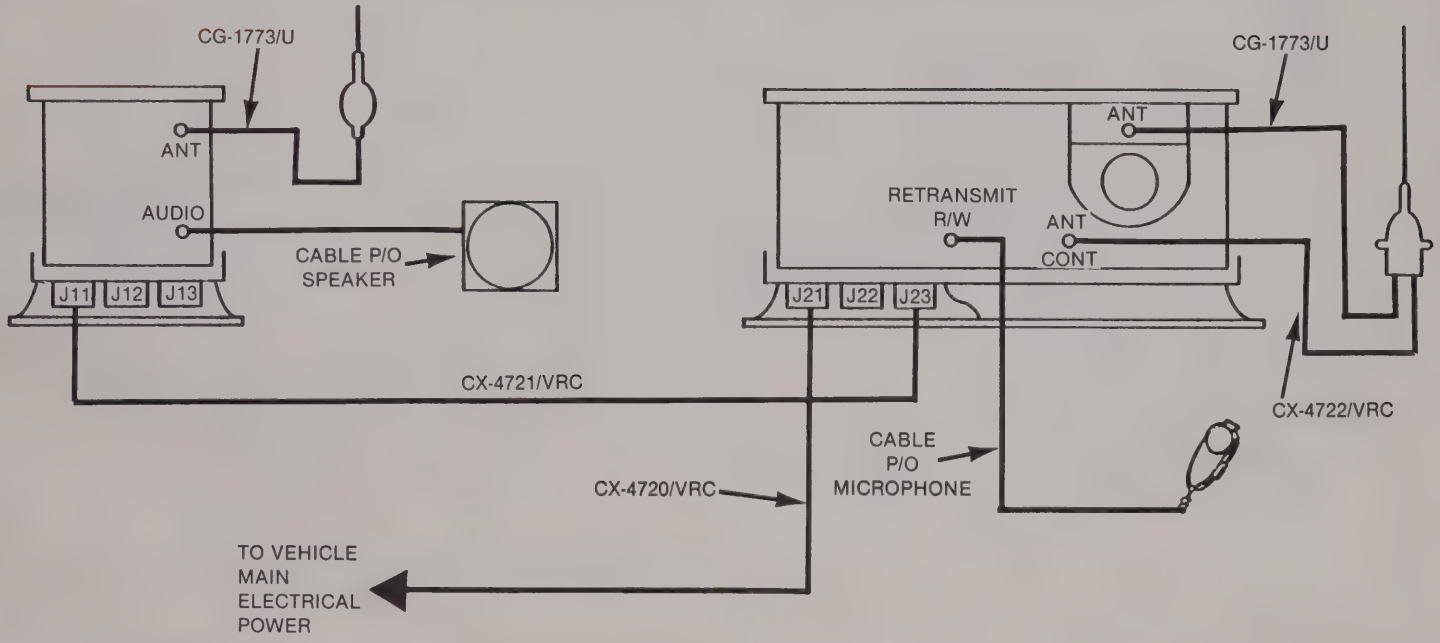
FOR USE WITH VINSON COMSEC EQUIPMENT.



2-52. TYPICAL CABLING OF RADIO SET AN/VRC-47

NOTE

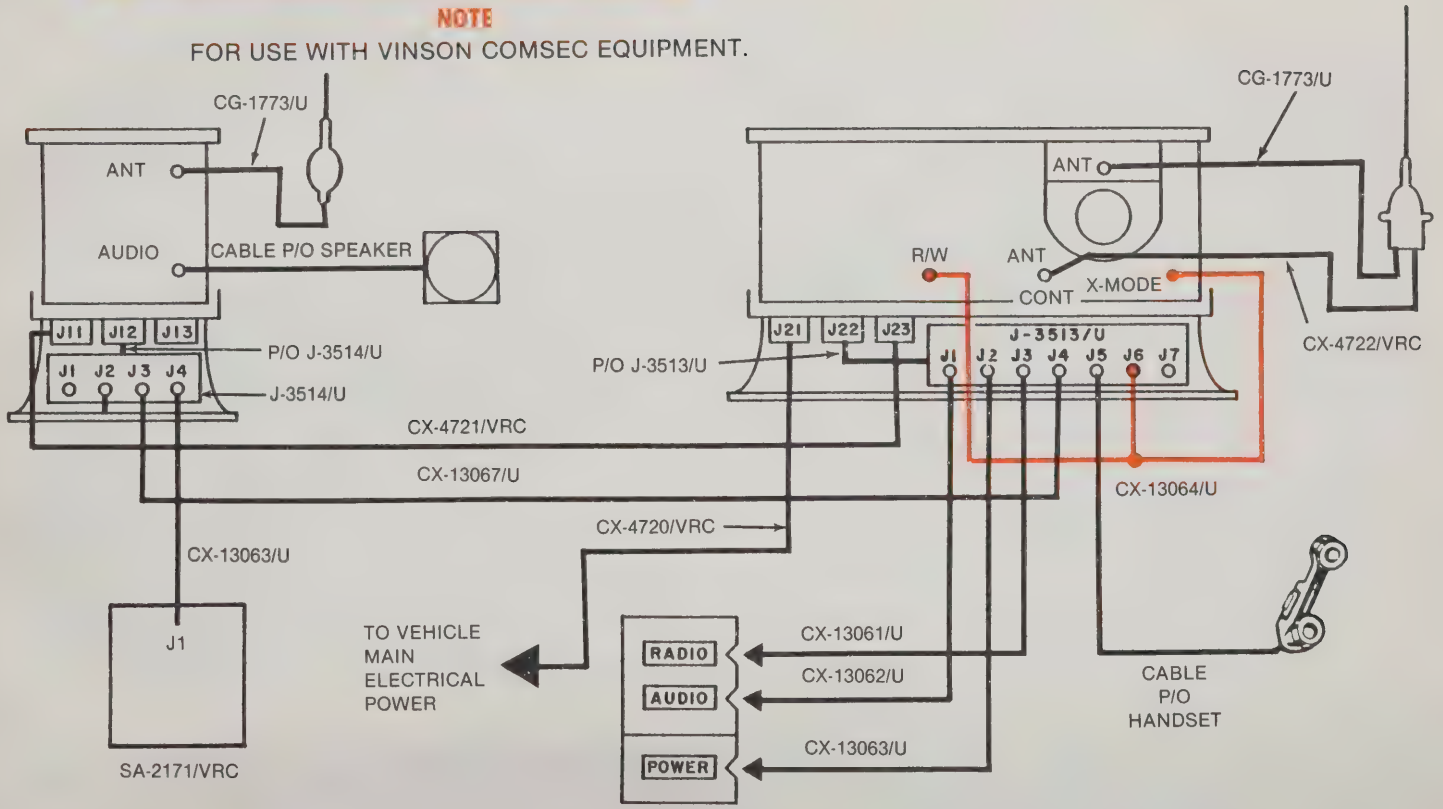
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-53. TYPICAL CABLING OF RADIO SET AN/VRC-47

NOTE

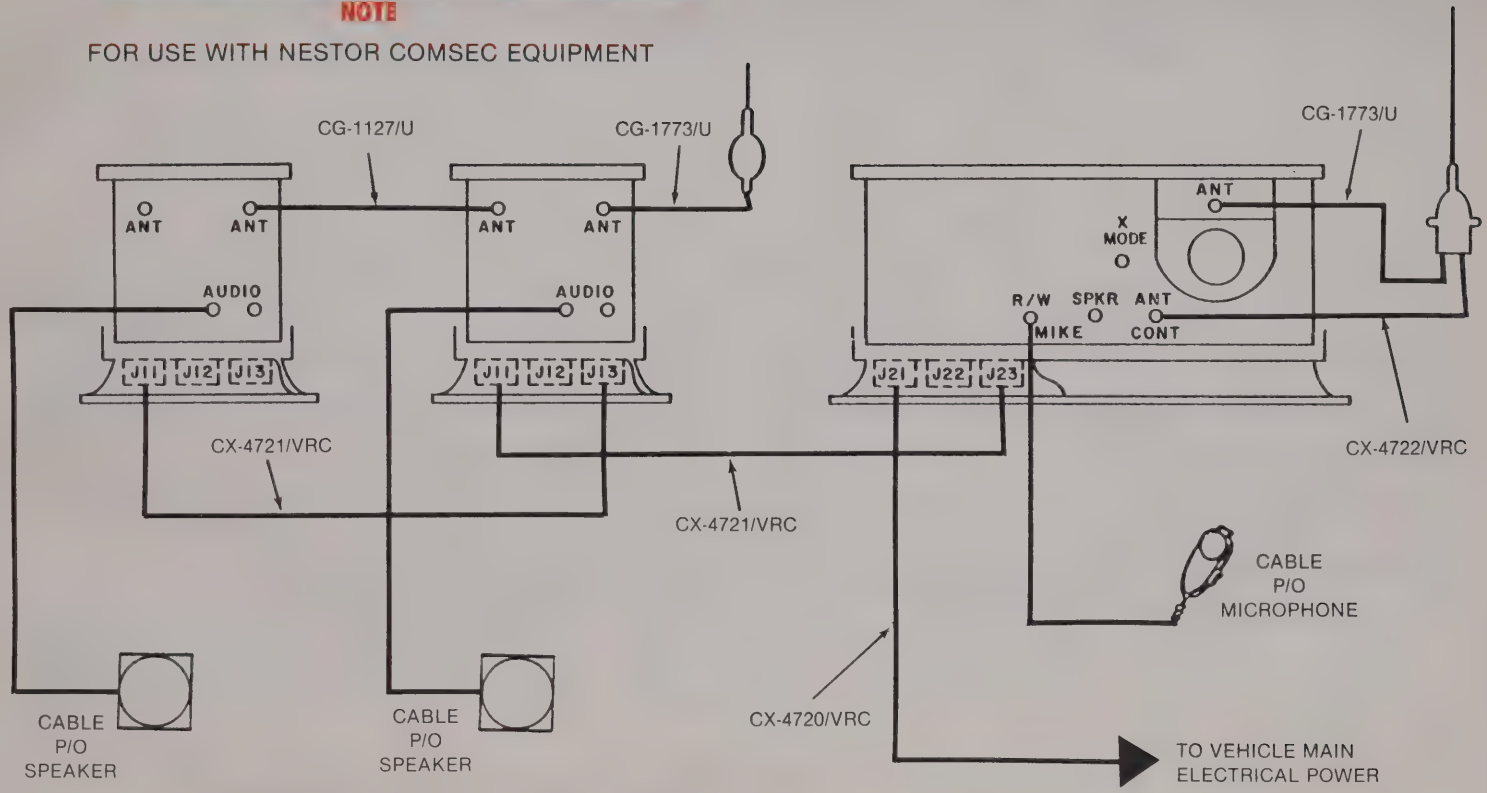
FOR USE WITH VINSON COMSEC EQUIPMENT.



2-54. TYPICAL CABLING OF RADIO SET AN/VRC-48

NOTE

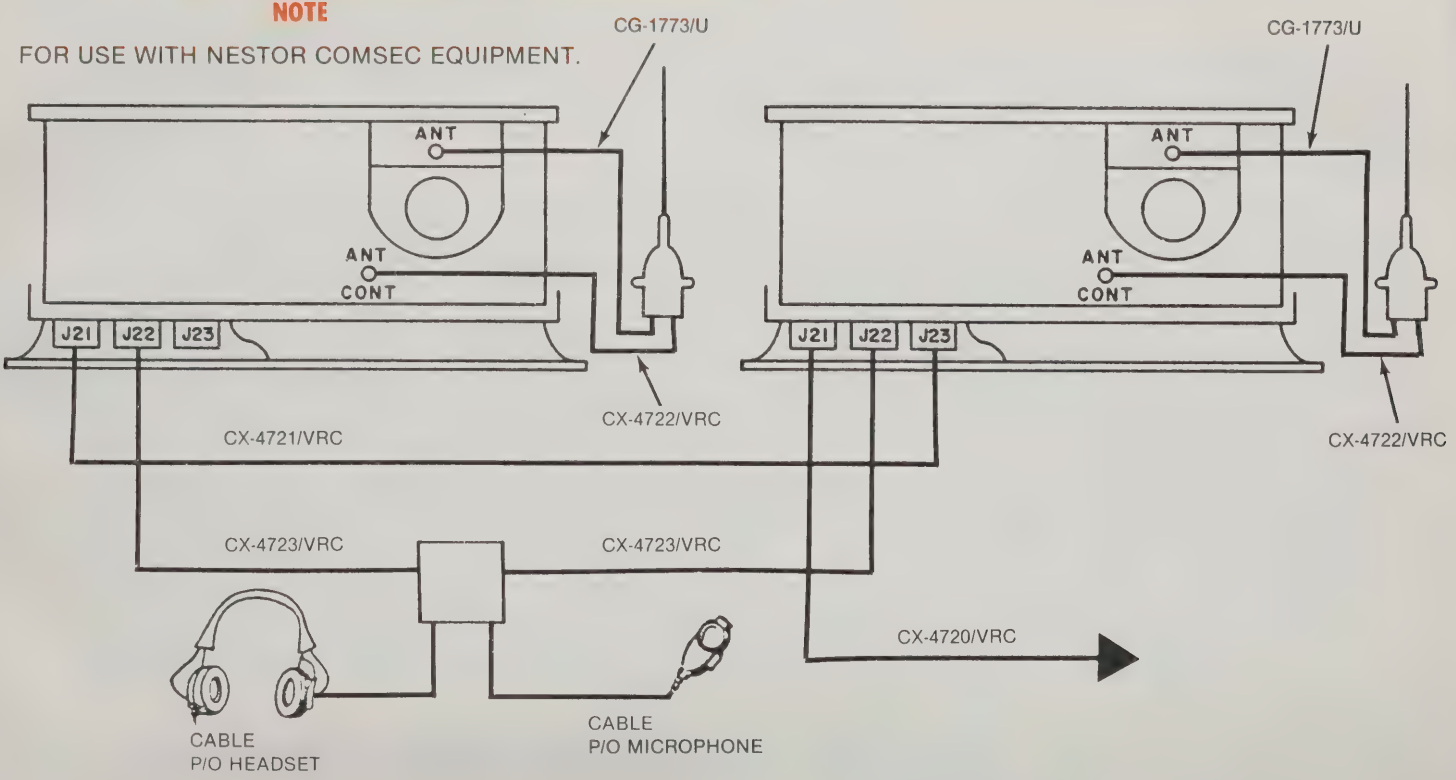
FOR USE WITH NESTOR COMSEC EQUIPMENT



2-55. TYPICAL CABLING OF RADIO SET AN/VRC-49

NOTE

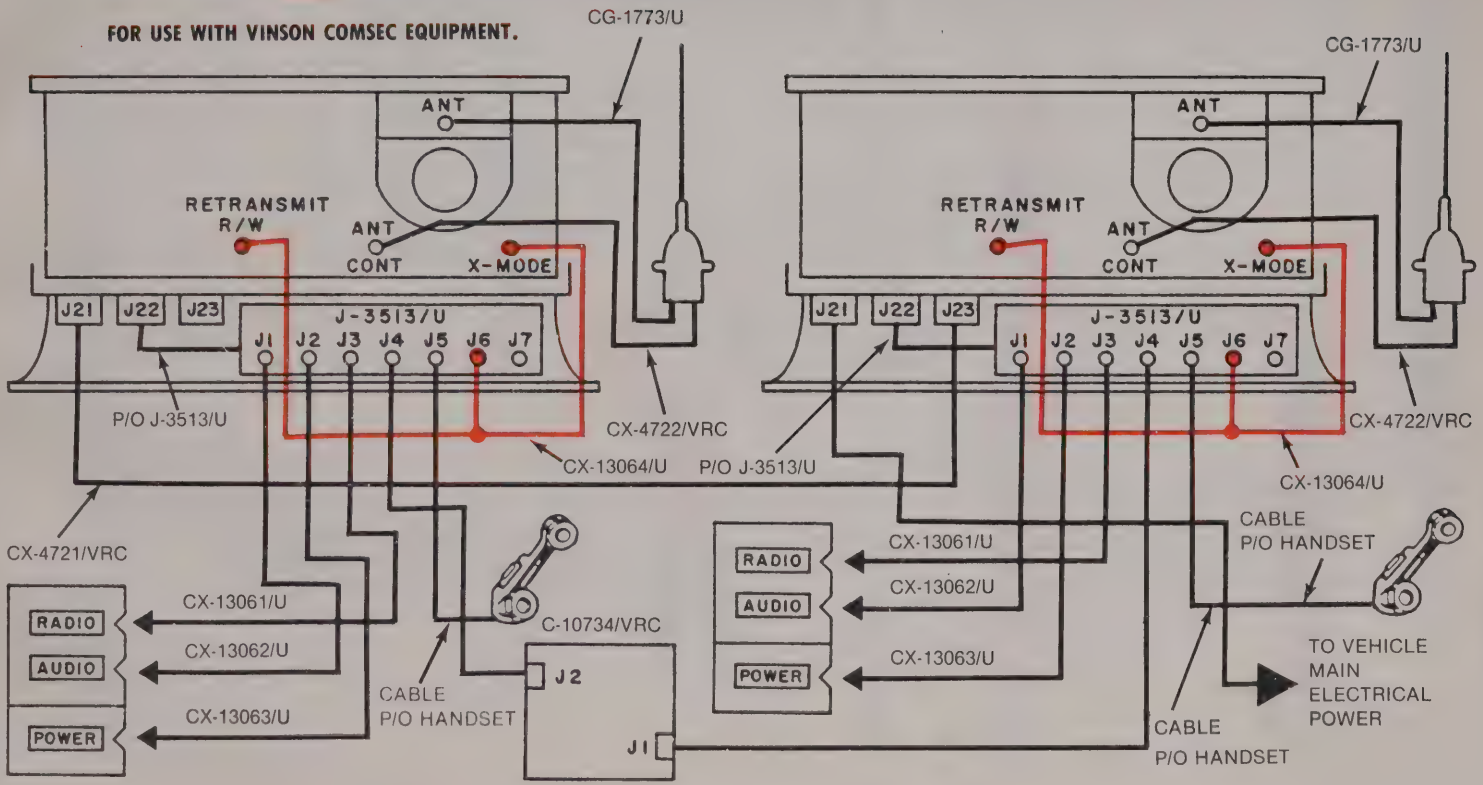
FOR USE WITH NESTOR COMSEC EQUIPMENT.



2-56. TYPICAL CABLING OF RADIO SET AN/VRC-49

NOTE

FOR USE WITH VINSON COMSEC EQUIPMENT.



Section V. SITING AND FREQUENCY SELECTION

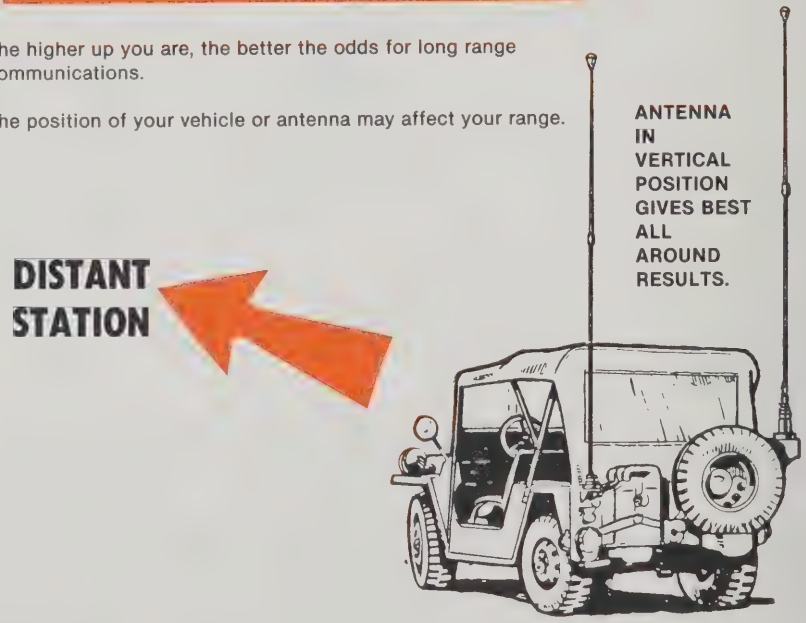
2-57. UNDESIRABLE LOCATIONS

If possible, avoid:

- Trees.
- Hills.
- Powerlines.
- Bridges.
- Buildings.

2-58. DESIRABLE LOCATIONS AND POSITIONS

- The higher up you are, the better the odds for long range communications.
- The position of your vehicle or antenna may affect your range.



TRY POSITIONING YOUR VEHICLE DIAGONALLY OR POINTING IT TOWARDS THE DISTANT STATION. THIS MAY IMPROVE COMMUNICATIONS.

WARNING

BE AWARE THAT AS YOU MOVE TO HIGHER GROUND OR TRY TO POSITION YOUR VEHICLE, YOU MAY BE MAKING YOURSELF MORE VISIBLE TO THE ENEMY.

2-59. AUTHORIZED OPERATING FREQUENCIES

Your authorized frequencies and call signs are found in the Communications Electronics Operation Instructions (CEOI).

BUT---

Carefully check all authorized frequencies and make sure the following CAUTIONS are followed:

CAUTION

DO NOT USE THE FOLLOWING FREQUENCIES BECAUSE THEY CAUSE IMPROPER OPERATION OF THE SET: —33.90MHz - 45.20MHz - 56.50MHz - 67.80MHz

CAUTION

DO NOT USE FREQUENCIES WHICH ARE SEPARATED EXACTLY BY 5.75 MHz OR 23.00 MHz.

CAUTION

DO NOT OPERATE TOO CLOSE TO OTHER RADIO SETS. THE FOLLOWING CHART SPECIFIES THE MINIMUM DISTANCE YOUR ANTENNA MUST BE FROM ANOTHER ANTENNA WHILE OPERATING AT DIFFERENT FREQUENCY SEPARATIONS.

Minimum frequency separation required	Minimum antenna distance separation (whip antenna or RC-292)	
	Between AN/VRC-12 series radio on HIGH power	Between AN/VRC-12 series radio on LOW power
10 MHz	5ft./1.5m.	5ft./1.5m.
7 MHz	60ft./18.3m.	10ft./3.0m.
4 MHz	150ft./45.7m.	50ft./15.2m.
2 MHz	400ft./12.9m.	200ft./61.0m.
1 MHz	800ft./243.8m.	350ft./106.7m.

CAUTION

DO NOT TRANSMIT ON FREQUENCIES ASSIGNED TO OTHER RADIO SETS OR COMMERCIAL STATIONS.

AND

If you have problems with interference, check with C-E ORG MAINT and have them check their INTERFERING FREQUENCIES CHARTS to make sure you are using an interference free frequency.

Section VI. OPERATION UNDER USUAL CONDITIONS

NOTE

THE FOLLOWING STEP-BY-STEP OPERATING PROCEDURES APPLY TO THE RADIO EQUIPMENT WITHOUT ANY VINSON OR NESTOR COMSEC EQUIPMENT BEING CONNECTED TO THE RADIOS.

CAUTION

Never start your vehicle while the radio or radios are on.

Always start your vehicle first and then proceed to operate the radio equipment.

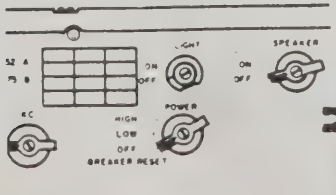
CAUTION

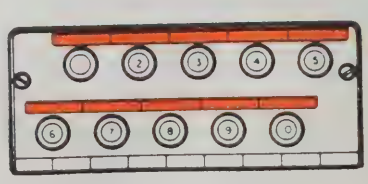
If possible, operate your radio with engine running. The engine speed should be high enough to indicate the battery is charging while you are transmitting on high power.

2-60. STEP 1 RECORD OPERATING FREQUENCIES

- Write your operating and alternate frequencies on the write-in plates on your equipment.

EXAMPLES:





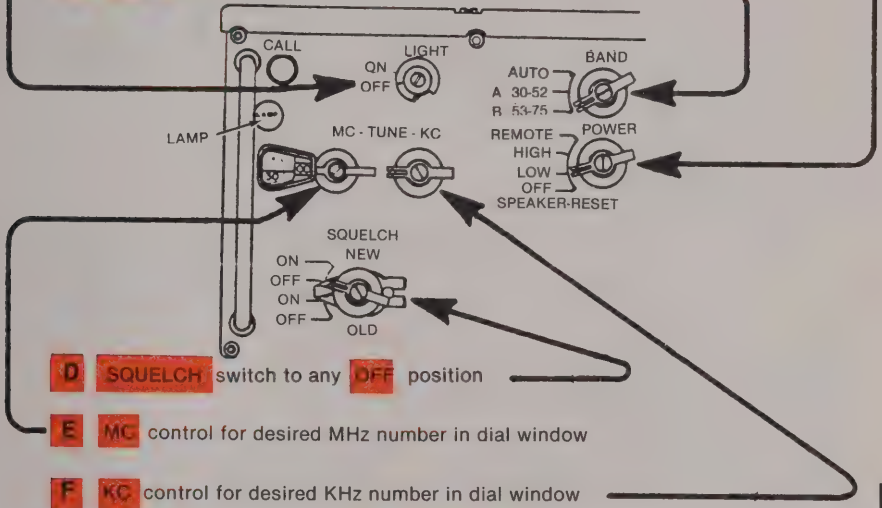
2-61. STEP 2 MANUAL TUNING THE R-T

Connect your audio accessories to the R-T and do the following:

A POWER switch to LOW

B LIGHT switch to ON for dial light and power for CALL indicator lamp.

C BAND switch to A or B



D SQUELCH switch to any OFF position

E MC control for desired MHz number in dial window

F KC control for desired KHz number in dial window

NOTE

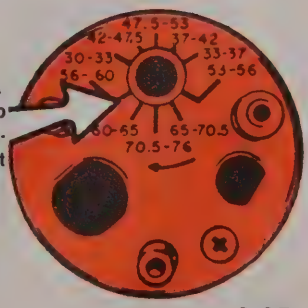
For blackout operation, the LIGHT switch is set to OFF.

CAUTION

IN SOME UNITS OF THE RT-524/VRC, the KC CONTROL CANNOT BE TURNED BEYOND THE LIMITS OF 00 AND 95 POSITIONS. TO PREVENT DAMAGE TO THE CONTROL MECHANISMS OF THESE UNITS. DO NOT ATTEMPT TO TURN THE KC CONTROL BEYOND 00 AND 95 POSITIONS.

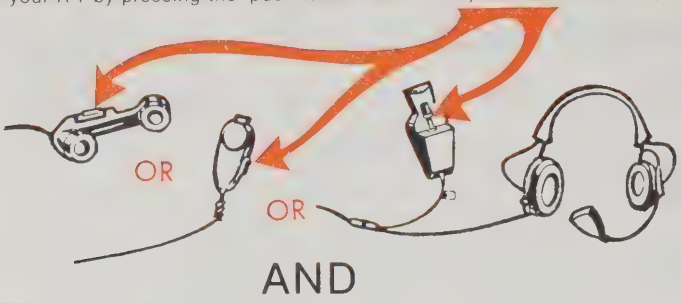
CAUTION

If you are using either the COMPACT or ROUND BASE ANTENNA without a cable connected from the R-T ANT CONT receptacle to the antenna matching unit, you must manually set the band control on the bottom of the antenna matching unit to a position that includes the operating frequency of the R-T.



2-62. STEP 3 ESTABLISH INITIAL COMMUNICATIONS

A Key your R-T by pressing the push-to-talk switch on your audio accessory. Examples:



You should hear the R-T blower running.

B Speak into your microphone.

You should hear sidetone in your earphone(s) or loudspeaker.

C Tell the distant station to transmit to you and then release your push-to-talk switch.

The sidetone should stop.

Normally the blower will stop running BUT if the equipment is warm, the blower will continue running.

D Listen to your loudspeaker or earphone(s) for the signal from the distant station.

Adjust your VOLUME control for a comfortable listening level

E If you cannot reach the distant station on LOW power, repeat the above procedures with the POWER switch set to HIGH.

F After establishing communications you may use SQUELCH operation if desired.

Set the SQUELCH switch to NEW ON or OLD ON as appropriate.

NOTE

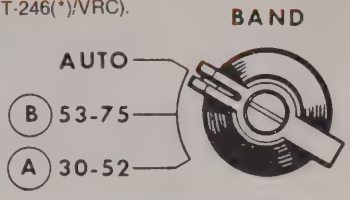
Instead of making SEQUELCH settings at this time, it is possible to make them during STEP 2 R-T OPERATION, MANUAL TUNING --- BUT ---
Make sure the distant station and you have your SEQUELCH controls in the same position.

2-63. **STEP 4 R-T SETUP FOR PUSHBUTTON OPERATION**

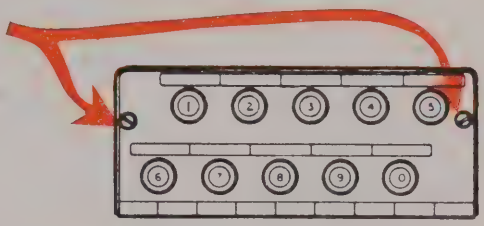
NOTE

This applies only to the PUSHBUTTON R-T (RT-246(*)/VRC).

A Move BAND switch to AUTO.

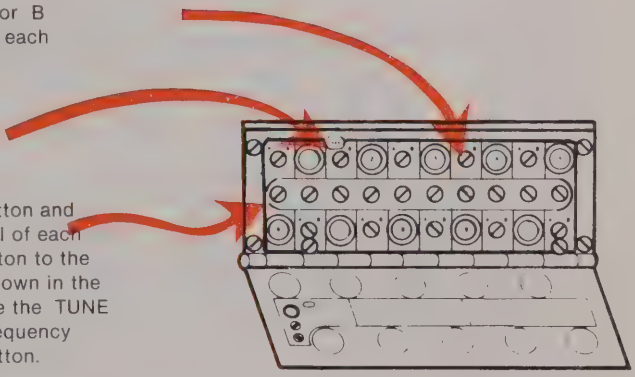


B Loosen captive screws on R-T to drop hinged cover.



C Turn BAND selector to either A (30 MHz-52.95 MHz) or B (53 MHz-75.95 MHz) for each preset channel.

D Press in the TUNE button and adjust PRESET control of each corresponding pushbutton to the correct frequency as shown in the DIAL WINDOW. Release the TUNE button to lock in the frequency for each preset pushbutton.



E After setting a preset pushbutton, check accuracy of your adjustments.

- Change frequency, either manually or with another pushbutton.
- Press pushbutton for each channel you preset.
- R-T should tune to exact frequency you preset as shown in the DIAL WINDOW.

F Tune the other pushbutton as required (steps C and D above).

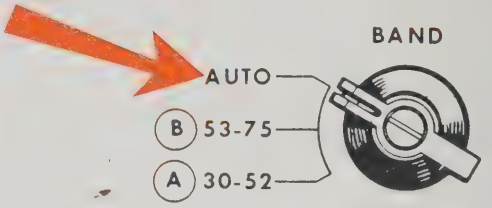
G Check each preset pushbutton setup (repeat step E above).

2-64. STEP 5 R-T PUSHBUTTON OPERATION

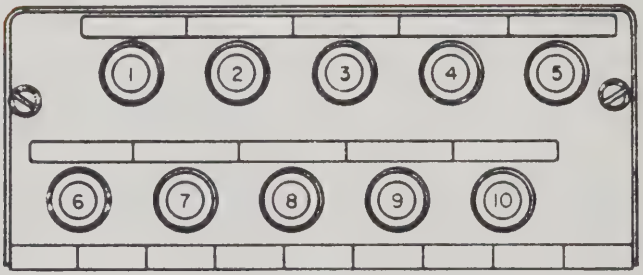
NOTE

This applies only to PUSHBUTTON R-T (RT)246(*)/VRC).

A Move BAND switch to AUTO.



B Push in the desired pushbutton.



NOTE

The tuner in the R-T will operate each time you press a pushbutton and automatically tune the receive and transmit circuits in the R-T.

C Repeat previous step 3 (para 2-62) to establish communications.

CAUTION

WAIT FOR THE TUNER TO STOP OPERATING BEFORE YOU CONTINUE. THIS TUNER ALSO AUTOMATICALLY TURNS THE DIAL NUMBERS TO THE FREQUENCY OF THE CHANNEL YOU HAVE SELECTED.

NOTE

Remember, for reliable communications, all radios should have their SQUELCH control in the same position.

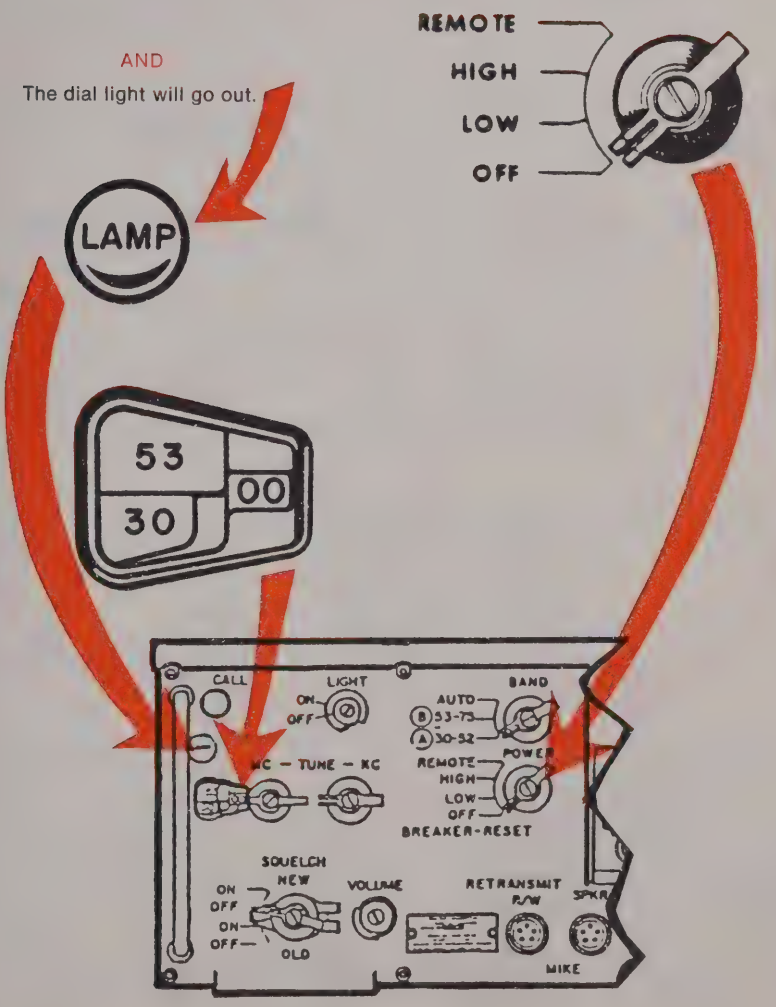
2-65. STEP 6 R-T TURN OFF PROCEDURES

A Turn the R-T **POWER** switch to **OFF**.

This will turn off the R-T.

AND

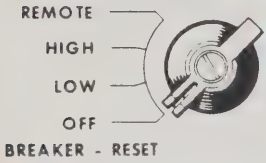
The dial light will go out.



2-66. STEP 7 REMOTE CONTROL OPERATION OF PUSHBUTTON R-T

NOTE

This step applies only to PUSHBUTTON R-T (RT-246(*)/VRC with pushbuttons operating properly and REMOTE CONTROL BOX (C-2742/VRC) connected to the R-T REMOTE receptacle.



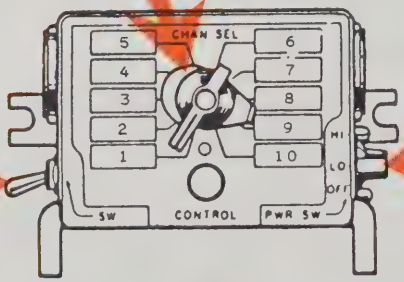
A POWER switch to REMOTE.

B To change R-T transmitter power, turn the PWRSW to HI or LO as desired.

C Activate your REMOTE CONTROL BOX by momentarily pushing the SW toggle switch.

D The CONTROL indicator lamp should light and you can now control the R-T from the REMOTE CONTROL BOX.

E To change R-T operating frequency, turn the CHAN SEL switch to the position that has been assigned to the desired frequency.



NOTE

On the CHAN SEL switch, position 1 corresponds to pushbutton 1; position 2 to pushbutton 2; position 3 to pushbutton 3; etc.

F To turn off the R-T, turn the PWR SW to OFF. The CONTROL indicator lamp should go out and the dial lamp on the R-T should go out.

2-67. STEP 8 TANDEM OPERATION OF REMOTE CONTROL BOXES

NOTE

In TANDEM operation of 2 REMOTE CONTROL BOXES (C-2742/VRC) only one REMOTE CONTROL BOX can control the PUSHBUTTON R-T.

Consider yourself as the operator of REMOTE CONTROL BOX "A".

A. Place your PWR SW to either HI or LO.

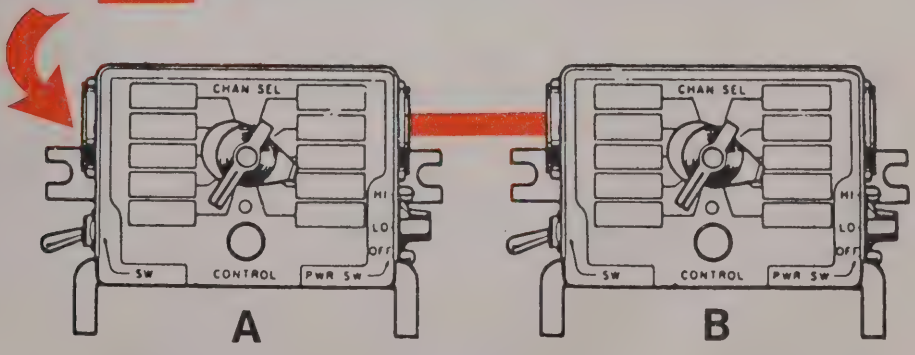
B. Press your toggle switch:
Your CONTROL lamp should light to tell you that you now have control of the PUSHBUTTON R-T.
and
the CONTROL lamp on box "B" should go out.

C. To return control of the R-T to the front panel controls on the R-T, turn the POWER switch on the R-T from REMOTE to HIGH or LOW.

NOTE

In TANDEM operation, ONLY the REMOTE CONTROL BOX connected to the PUSHBUTTON R-T can turn the R-T on and off. In the drawing shown, this is box "A".

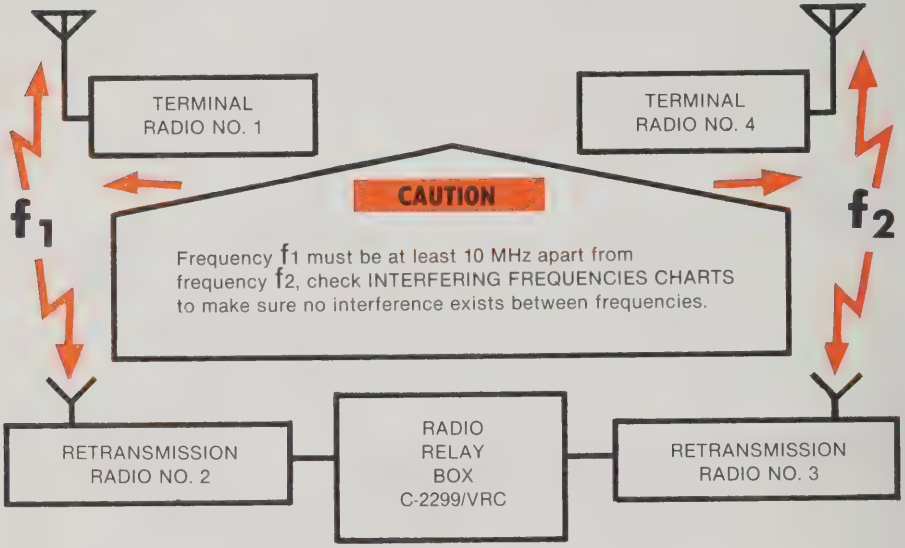
To R-T REMOTE receptacle.



2-68. STEP 9 BASIC RADIO RELAY OPERATION

NOTE

This applies to Radio Set AN/VRC-45 or AN/VRC-49 when hooked up for radio relay operation using the RADIO RELAY BOX (C-2299/VRC).



RADIO SET AN/VRC-45 or AN/VRC-49

NOTE

C-E ORG MAINT has the INTERFERING FREQUENCIES CHARTS.

A Establish satisfactory communications between Terminal Radio No. 1 and your R-T, Retransmission Radio No. 2 on frequency f_1

B Establish satisfactory communications between Terminal Radio No. 4, and your R-T, Retransmission Radio No. 3 on frequency f_2.

C Notify each Terminal Radio to communicate with each other.

BUT

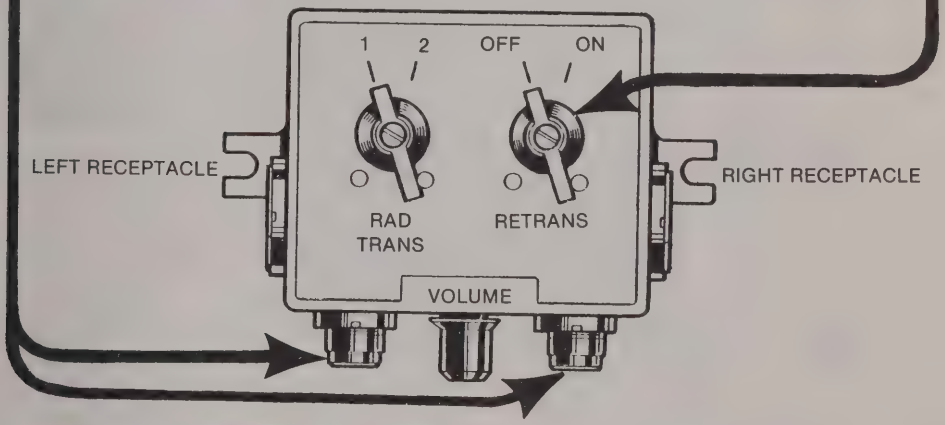
Make sure that all R-T's in the relay hookup have their SQUELCH controls set in the same SQUELCH mode.

2-68. STEP 9 BASIC RADIO RELAY OPERATION - Continued

D Place the RETRANS switch on your RELAY BOX to ON. (This automatically connects the radio relay communications through your equipment.)

E The retransmission communications can be monitored by you. Use the audio accessories connected to the front two receptacles on the RELAY BOX.

F Your VOLUME control only works with your audio accessories connected to the RELAY BOX, it has no effect on the relayed signals.



G Turn the RETRANS switch to OFF to stop radio relay operation.

Now each R-T can operate independently.

AND

The audio accessories connected to the RADIO RELAY BOX (C-2299/VRC) can only work with one R-T.

H Turn the RAD TRANS switch to position 1. The audio accessories connected to the RADIO RELAY BOX now operate with the R-T connected to the left receptacle on the RADIO RELAY BOX.

OR

Turn the RAD TRANS switch to position 2. Now the audio accessories operate with the R-T connected to the right receptacle.

NOTE

Remember, only NESTOR COMSEC equipment can be used with this radio relay hookup with RADIO RELAY BOX (C-2299/VRC).

2-69. STEP 10 X-MODE OPERATION WITH ANY R-T

NOTE

The following apply to any R-T on any type of R-T MOUNT.

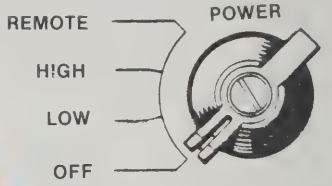
- The X-MODE - NORMAL switch inside your R-T should be in the X-MODE position for both NORMAL and X-MODE operation.

NOTE

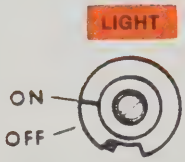
- It is a good idea to have all radio equipment tagged to indicate the position of this internal switch.

If your R-T is not tagged or you suspect that the internal switch is set wrong, you do not have to call C-E ORG MAINT to open up your R-T, you can do the following check:

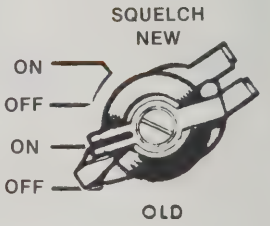
A Turn your R-T ON



B Set the LIGHT switch to ON



C Place the SQUELCH control to OLD ON .



D Remove the cover from the R-T X-MODE receptacle,

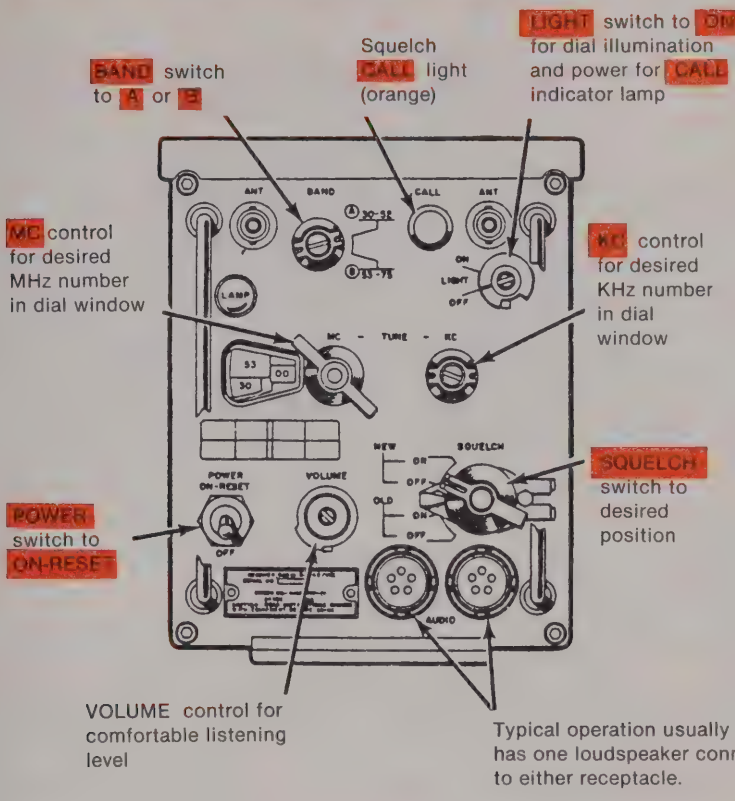
and if your CALL lamp lights, you are OK, your internal switch is set at X-MODE.

BUT--- If your CALL lamp does not light, you are not OK. Your internal switch is set at NORMAL. Call C-E ORG MAINT and ask them to open up your R-T and to set your switch.

CAUTION

AN OPERATOR IS NOT AUTHORIZED TO OPEN ANY R-T OR AUX RECEIVER TO CHECK OR SET THIS SWITCH.

2-70. STEP 11 AUX RECEIVER OPERATION



CAUTION

FOR BLACKOUT OPERATION, THE LIGHT SWITCH IS SET TO OFF.

NOTES

1. When any AUX RECEIVER is mounted on a VINSON AUX RECEIVER MOUNT, the internal X-MODE - NORMAL switch inside the AUX RECEIVER must be in the X-MODE position. You then can operate (receive) either in the clear (nonsecure) or secure (X-MODE) by properly using the VINSON COMSEC equipment.

2. When any AUX RECEIVER is mounted on a REGULAR AUX RECEIVER MOUNT, the AUX RECEIVER'S internal X-MODE - NORMAL switch must always be in the NORMAL position and you can only operate (receive) in the clear (nonsecure).

2-71. PREPARATION FOR MOVEMENT

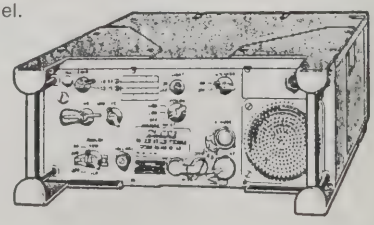
Routine movement normally requires that the antennas be tied down.

CAUTIONS

- Make sure the antenna tiedown clamp is properly installed.
- Make sure the tiedown ropes are connected to a safe place, if you are not sure what a safe place is, check with your chief.
- Make sure antennas do not cross each other.
- Make sure no antenna extends beyond the sides of the vehicle.
- Make sure that an antenna tip cap is securely taped on each antenna.
- Before starting the vehicle, make sure the radios are turned off.

2-72. PACKING AND SHIPMENT

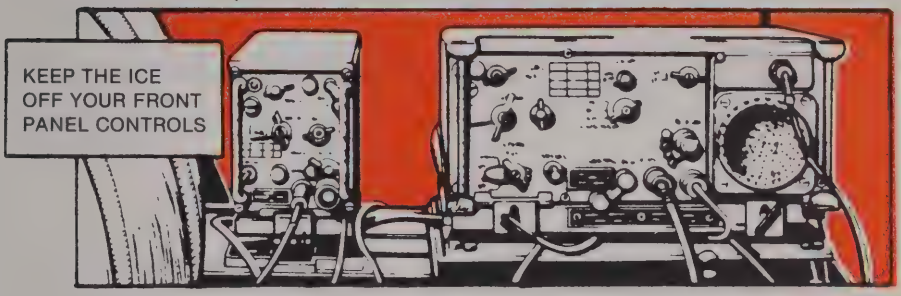
When shipping a radio, tie or brace it in the vehicle or container so it will not bounce around and damage the guards or handles on the front panel.



Section VII. OPERATION UNDER UNUSUAL CONDITIONS

2-73. OPERATION AT LOW TEMPERATURES

Keep radio front panel controls free of ice.



KEEP ICE OFF YOUR ANTENNAS.

- Do not bend your cables and cords suddenly.
- If possible, keep radio equipment on. If not possible, warmup both the R-T and AUX receivers before operation.
- Make sure that the vehicle charging system can maintain a satisfactory battery charging rate.

2-74. OPERATION IN DESERT AND DUSTY AREAS

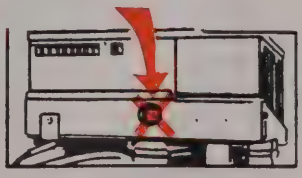
Keep equipment area as dust-free as possible.

If your radio equipment is constantly exposed to the sun, it should be protected with a heat reflecting paint. Request this service from your supporting maintenance group.

Watch the water level in the vehicle battery. Keep it at the proper level.

AND - UNDER ALL CONDITIONS

Make sure the R-T blower port area is free for proper airflow.



2-75. EMERGENCY PROCEDURES

- AUX RECEIVER FAILS:

  If available, use a pushbutton channel to cover the AUX receiver frequency.

- R-T ANTENNA BROKEN OR INOPERATIVE:

  If vehicle is not to be moved, use a long wire antenna.
  You may use the AUX receiver antenna, but this may reduce distance.

NOTE

If you are not moving and you have a broken or unusable whip antenna, a pice of field wire or other insulated wire can be used to makeup a temporary antenna.

Suggestion Ask your supervisor to get you a copy of Training Circular, TC 11-5 (KNOW HOW TO REPAIR AND FABRICATE ANTENNAS).

- HEAT PROBLEMS-THE R-T BLOWER KEEPS RUNNING WHEN THE R-T IS NOT KEYED AND THE R-T CASE IS WARMER THAN NORMAL.

  Soak a towel or T-shirt in clear water. Wring it out as much as possible. Carefully place it on top of the R-T. Make sure it does not cut of the airflow behind the R-T.

CAUTION

If possible, use this emergency procedure only if your R-T has been checked out during the past 3 months by C-E ORG MAINTENANCE for proper R-T output and proper matching of the R-T to its antenna.

Another way to help reduce the heat generated by the R-T is to operate the R-T with the R-T input voltage at the lower limits (24 to 28 volts dc) - the closer to 24 volts, the better.

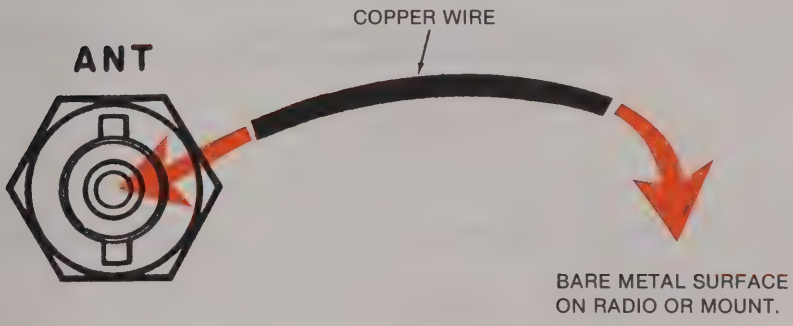
2-76. JAMMING

Recognition and identification of jamming.

- A common jamming procedure is the transmission of a strong or annoying signal on your frequency, making it difficult or impossible for you to maintain communications.
- Sometimes this signal may be from a friendly station.
- Unusual noise or interference may be from a local source or your receiver may not be working right.

Check out your receiver.

- Disconnect the antenna.
- Short out your antenna receptacle to the radio chassis.



AND

If the noise or interference continues, you have a bad receiver.

WARNING

WHEN YOU KNOW THAT YOU ARE BEING JAMMED, NOTIFY YOUR SUPERIOR AS SOON AS POSSIBLE.

2-77. ANTIJAMMING PROCEDURES

- Try to get rid of the effects of the jamming signal by repositioning your vehicle.

- Try to use a nearby obstruction as a screen. Place your vehicle so that the obstruction acts as a screen between you and the possible interfering transmitter site.

- You may get rid of the jamming by pointing your vehicle towards the distant station you are communicating with. Try several vehicle positions.

- Change the setting of your VOLUME control. Thismay enable you to raise the level of the desired signal enough to be distinguished from the jamming signal.

  Ask the station you are communicating with to switch to HI power if it is on LO power.

- If you cannot maintain communications after trying all possible procedures, get permission to change to another frequency.

WARNING

Make sure any antijamming action you take does not make you an easy target for the enemy. Be careful.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. LUBRICATING INSTRUCTIONS

3-1. SILICONE COMPOUND

Use Silicone Compound MIL-S-8660.

- Use on antenna sections.
- Clean threads before you apply the SILICONE COMPOUND.
- Put on male threads only.

CAUTION

Do not use graphite grease on the threads.

Use on O-rings and accessory connectors (small amount with care).

CAUTION

Make sure no SILICONE COMPOUND gets on the contacts or pins of any receptacle.

Section II. TROUBLESHOOTING PROCEDURES

The TROUBLESHOOTING chart tells you some of the troubles you may encounter during the operation of the radio sets wheny they are used without intercom equipment. You should perform the tests, inspections and corrective actions in the order listed.

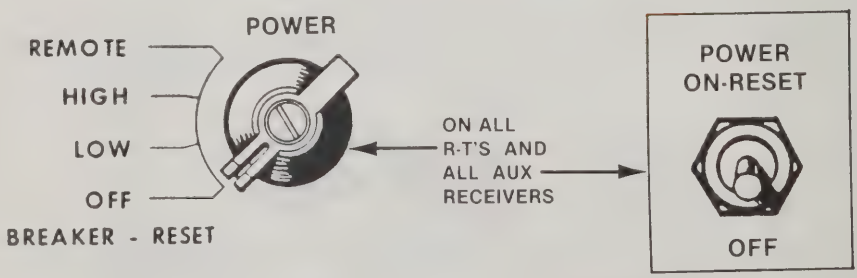
This manual cannot cover all the troubles that may occur, nor all tests or inspections and corrective actions. If a trouble is not listed or it cannot be corrected by doing the corrective actions, notify your supervisor.

NOTES

1. Before you try troubleshooting, check with C-E ORG MAINTENANCE to make sure that:
   - A. The links in al radios are properly set.
   - B. The X-MODE - NORMAL switch inside all radios is properly set.
   - C. Radio Equipment is properly connected to the battery charging system.
   - D. Vehicle battery charging system is working OK.
2. The following troubleshooting procedures apply to troubleshooting the radio equipment only, WITHOUT any VINSON or NESTOR COMSEC equipment connected to the radios and the cap snugly screwed on the R-T X-MODE receptacle.

CAUTION

DOUBLE CHECK TO MAKE SURE THAT POWER IS OFF WHEN REMOVING OR REPLACING ANY RADIO.



WHEN YOU REMOVE ANY RADIO, MAKE SURE YOU PULL IT STRAIGHT BACK AND WHEN YOU INSTALL ANY RADIO, MAKE SURE YOU PUSH IT STRAIGHT IN.

Table 3-1. TROUBLESHOOTING - Continued

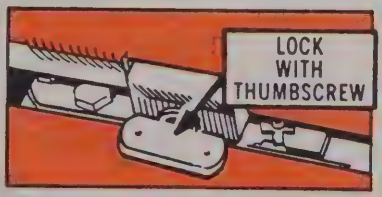
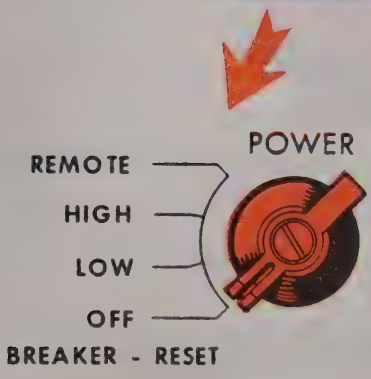
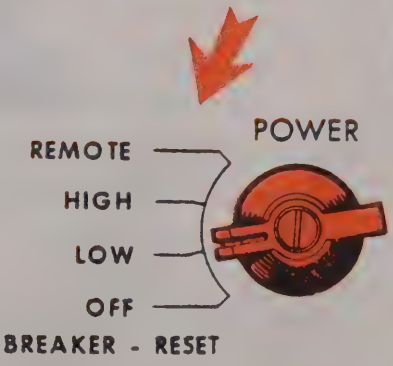
TROUBLE Test or Inspection	Corrective action.
TROUBLESHOOTING A RADIO SYSTEM WITH ONE R-T (AN/VRC-43 or AN/VRC-46)	
1 WHEN YOU "KEY THE TRANSMITTER," NO SOUND IS HEARD. THE BLOWER DOES NOT RUN, THE DIAL LAMP DOES NOT LIGHT. THE RECEIVER SECTION OF THE R-T IS DEAD	
Step 1. Check to see if the R-T is firmly connected to its mount.	
CAUTION MAKE SURE THE POWER SWITCH IS AT OFF.	
Loosen the R-T, pull it straight back, make sure the guide pins line up and then push the R-T firmly into place and tighten the mount to R-T clamps.	
	
Step 2. Check to see if the R-T circuit breakers have been tripped.	
Set the R-T POWER switch first to OFF BREAKER RESET and then to either HIGH or LOW.	
	

Table 3-1. TROUBLESHOOTING - Continued

TROUBLE Test or Inspection Corrective action.	
2	WHEN YOU "KEY THE RADIO," YOU HEAR SIDETONE BUT THE DISTANT STATION DOES NOT ANSWER. THE RECEIVER SECTION OF THE R-T IS OK WHEN YOU TURN IN OTHER STATIONS.
Step 1.	Check to see that R-T tuning controls are set to the assigned frequency. **Change the tuning controls to another frequency and then back to the assigned frequency.**
Step 2.	Make sure you have enough transmitter power to reach the distant station. **Transmit on HIGH power.**
Step 3.	Attempt communications on an alternate frequency. **If an alternate frequency schedule is made up, switch to the authorized alternate frequency.**
Step 4.	Check transmitter for normal operation. **If possible, attempt to communicate with another nearby station.**
Step 5.	Check the whip antenna tuning circuits located in the antenna matching base by listening for the sound of relays operating as your change frequencies. **Manually tune the antenna if possible or switch antennas if authorized.**
Step 6.	Check to see that both antenna elements are tightly screwed together. **Turn off transmitter and re-tighten antenna sections.**
Step 7.	Test for best antenna orientation. **If the whip antenna is tied down, untie it and reposition your vehicle in several locations or positions.**

Table 3-1. **TROUBLESHOOTING - Continued**

TROUBLE Test or Inspection Corrective action.

3 WHEN YOUR SQUELCH IS SET TO NEW ON YOU CANNOT RECEIVE THE DISTANT STATION AND YOUR CALL LAMP DOES NOT LIGHT.

Step 1. Verify that the distant station is transmitting with its SQUELCH switch at NEW ON, NEW OFF, OR OLD OFF.

Set your SQUELCH switch to NEW OFF and communicate with the distant station telling him to place his SQUELCH to NEW ON.

Step 2. Verify that the distant station is too far away for SQUELCH operation.

Communicate with the distant station with your SQUELCH switch set to NEW OFF.

4 WHEN YOU PRESS A PUSHBUTTON ON YOUR R-T, YOU CANNOT HEAR THE AUTOMATIC TUNER INSIDE THE R-T OPERATE AND THE DIAL NUMBERS DO NOT CHANGE.

NOTE

This applies to RT-246(*)/VRC only.

Step 1. Check the position of the BAND switch on your R-T.

Turn the BAND switch to AUTO.

Step 2. Check out this pushbutton to see if it is bad.

Select another pushbutton and press it.

Step 3. Check to see if all the pushbuttons are bad.

Tune the R-T manually with the MC and KC controls.

5 COMMUNICATIONS CANNOT BE ESTABLISHED WITH THE DISTANT STATION WHEN YOU ARE USING THE REMOTE CONTROL BOX (C-2742/VRC) TO CONTROL YOUR R-T.

NOTE

This applies to RT-246(*)/VRC with its pushbuttons properly set-up.

Step 1. Verify that your R-T is capable of operating independently.

Return control to the R-T by placing the R-T POWER switch LO or HI and the BAND switch to either Ⓐ or Ⓑ and check out R-T operation without the REMOTE CONTROL BOX.

Step 2. Check to see that the REMOTE CONTROL BOX operates properly to take control of the R-T (with the R-T POWER switch at REMOTE).

Momentarily press the toggle SW on the REMOTE CONTROL BOX and see if the CONTROL indicator lights up.

Table 3-1. TROUBLESHOOTING - Continued

TROUBLE Test or Inspection	Corrective action
TROUBLESHOOTING A RADIO SYSTEM WITH ONE R-T AND ONE AUX RECEIVER (AN/VRC-12 OR AN/VRC-47).	
6 R-T IS OK. AUX RECEIVER DIAL LAMP DOES NOT LIGHT. AUX RECEIVER IS DEAD.	
Step 1.	Check to see if the AUX receiver is firmly connected to its mount.
	Loosen the AUX receiver, pull it back, make sure the guide pins line up and then push the AUX receiver firmly into place and tighten the mount to AUX receiver clamps.
Step 2	Check to see if the AUX receiver circuit breakers have been tripped.
	Set the AUX receiver POWER switch to OFF and then back to ON RESET
7 R-T IS OK. AUX RECEIVER DIAL LIGHT GLOWS. NO SOUND IS HEARD ON THE AUX RECEIVER.	
Step 1.	Check for a defective AUX receiver front panel audio receptacle.
	Connect your known good audio accessory to the other AUX receiver front panel audio receptacle.
8 R-T IS OK. AUX RECEIVER DIAL LIGHT GLOWS AND RUSHING SOUND IS HEARD. REPLY FROM DISTANT STATION CANNOT BE HEARD ON THE AUX RECEIVER.	
Step 1.	Check to see that the AUX receiver tuning controls are accurately tuning to the frequency indicated by the dial numbers.
	If possible, attempt to receive a signal from another transmitter operating on a different frequency and then retune the AUX receiver to the assigned frequency.
Step 2.	Check for best AUX receiver antenna orientation.
	If the AUX receiver antenna is tied down, untie it and reposition your vehicle in several locations and positions. Follow troubleshooting instruction 3.
9 AUX RECEIVER IS OK. R-T DOES NOT OPERATE PROPERLY OR IS COMPLETELY DEAD.	
Step 1.	Troubleshoot the R-T.
	Follow troubleshooting instructions 2, 3, 4, 5 and 6.

Table 3-1. TROUBLESHOOTING - Continued

TROUBLE Test or Inspection Corrective action	
TROUBLESHOOTING A RADIO SYSTEM WITH ONE R-T AND TWO AUX RECEIVERS (AN/VRC-44 OR AN/VRC-48)	
10	R-T IS INOPERATIVE. BOTH AUX RECEIVERS WORK. **Step 1.** Troubleshoot the R-T. **Follow troubleshooting instructions 2, 3, 4, 5, and 9.**
11	R-T IS OK BUT BOTH AUX RECEIVERS ARE INOPERATIVE. **Step 1.** Troubleshoot each AUX receiver. **Follow troubleshooting instructions 7, 8 and 9.**
12	ONE AUX RECEIVER IS INOPERATIVE. THE OTHER AUX RECEIVER AND THE R-T ARE OK. **Step 1.** Verify that the mount for the inoperative receiver is OK. **Remove the good AUX receiver from its mount and replace it with the AUX receiver you are troubleshooting.** **Step 2.** Troubleshoot the AUX receiver. **Follow troubleshooting instructions 7, 8 and 9.**
TROUBLESHOOTING A RADIO SYSTEM WITH TWO R-T'S (AN/VRC-45 OR AN/VRC-49).	
13	ONE R-T IS INOPERATIVE, THE OTHER R-T IS OK. **Step 1.** Verify that the mount for the inoperative R-T is OK. **Remove the good R-T from its mount and substitute the R-T you are troubleshooting.** **Step 2.** Troubleshoot the R-T. **Follow troubleshooting instructions 2, 3, 4, 5 and 6.**
14	BOTH R-T'S ARE INOPERATIVE. **Step 1.** Troubleshoot each R-T. **Follow troubleshooting instructions 2, 3, 4, 5 and 6.**

APPENDIX A
REFERENCE

DA Pam 310-4	Index of Technical Publications: Technical Manuals, Technical Bulletins, Suply Manuals (Types 7, 8 and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	Modification Work Orders.
SB 11-131	Vehicular Radio Sets and Authorized Installations.
SB 11-624	Warning Notice for Vehicles in Which Radios Are Mounted.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment.
TM 11-5810-256-OP-1	Net Controller Operating Procedures for Communications Security Equipment TSEC/KY-57.
TM 11-5810-256-OP-4	Operating Procedures for Communications Security Equipment TSEC/KY-57 in Tracked Vehicles.
TM 11-5810-256-12	Operator's and Organizational Maintenance for Communications Security Equipment TSEC/KY-57.
TM 11-5810-290-14&P	Operator's and Organizational, Direct Support and General Support Maintenance Manual for Installation Kits, Electronic Equipment Used With Communications Security Equipment TSEC/KY-38 and HYL-3/TSEC.
TM 11-5810-300-12	Operator's and Organizational Maintenance Manual for NESTOR Communications Systems Using TSEC/KY-8 and TSEC/KY-38 with Radio Sets and Associated Equipment.

APPENDIX A - (Continued)

TM 11-5810-312-12	Operator's and Organizational Maintenance Manual Installation Kits for Communications Security Equipment TSEC/KY-57.
TM 11-5815-224-14	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists: Suppressor, Electrical Transient MX-7778A/GRC.
TM 11-5820-348-15	Organizational, Direct Support, General Support, and Depot Maintenance Manual: Antenna Equipment RC-292.
TM 11-5820-401-10-1	Operator's Manual: AN/VRC-12 Series of Radio Sets Used Without Intercom Systems.
TM 11-5820-401-10-2-HR	Hand Receipt Technical Manual Covering End Item/Components of End Item (COEI). Basic Issue Items and Additional Authorization List (AAL) Related to AN/VRC-12 Series of Radio Sets Used With Intercom Systems.
TM 11-5820-401-12	Operator's and Organizational Maintenance Manual: Radio Sets AN/VRC-12 Series.
TM 11-5830-340-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools Lists for Intercommunications Set AN/VIC-1(V).
TM 11-5915-223-12	Operator's and Organizational Maintenance Manual Including Repair Parts and Special Tools List: Suppressor, Electrical Transient MX-7778/GRC.
TM 11-5965-262-13	Organizational and Direct Support Maintenance Manual (Including Repair Parts and Special Tools Lists): Headset-Microphone H-161/U and H-161A/U (FSN 5965-082-4037 and 5965-824-4871).

APPENDIX A - (Continued)

TM 11-5965-280-15	Operator's, Organizational, and Direct Support, Maintenance Manual Including Repair Parts and Special Tools List: Headset H-189/GR.
TM 11-5985-262-15	Operator, Organizational, DS, GS, and Depot Maintenance Manual: Including Repair Parts and Special Tools Lists: AS-1729/VRC.
TM 11-5985-355-13	Operator's, Organizational, and Direct Support Maintenance Manual Antenna AS-2731/GRC.
TM 11-5985-357-13	Operator's, Organizational and Direct Support Maintenance Manual for Antenna Group OE-2541/GRC.
TM 38-750	The Army Maintenance Management Systems (TAMMS).
TM 750-244-2	Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command).
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment.

APPENDIX B
COMPONENTS OF END ITEM LIST

Section I. INTRODUCTION

B-1. SCOPE

This appendix lists integral components of Radio Sets AN/VRC-12 and An/VRC-43 through AN/VRC-49 to help you inventory items required for safe and efficient operation.

B-2. GENERAL

This Components of End Item List is divided into the following sections.

a. Section II. Integral Components of the End Item. These items, when assembled, comprise Radio Sets AN/VRC-12 and AN/VRC-43 through AN/VRC-49 and must accompany them whenever they are transferred or turned in. The illustration will help you identify these items.

b. Section III. Basic Issue Items. Not applicable.

B-3. EXPLANATION OF COLUMNS

a. Illustration. This column is divided as follows:

(1) Figure number. Indicates the figure number of the illustration on which the item is shown.

(2) Item number. The number used to identify item called out in the illustration.

b. National Stock Number. Indicates the National stock number assigned to the item and which will be used for requisitioning.

c. Description. Indicates the Federal item name and, if required a minimum description to identify the item The part number indicates the primary number used by the manufacturer, which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. Following the part number, the Federal Supply Code for Manufacturers (FSCM) is shown in parentheses.

d. Location. If the physical location is necessary to help you inventory each major item, it will be listed in this column.

e. Usable on Code. Not applicable.

f. Quantity Required (Qty Reqd). This column lists the quantity of each item required for a complete major item.

g. Quantity. This column is left blank for use during an inventory. Under the Rcvd column, list the quantity you actually receive on your major item. The Date columns are for your use when you inventory the major item.

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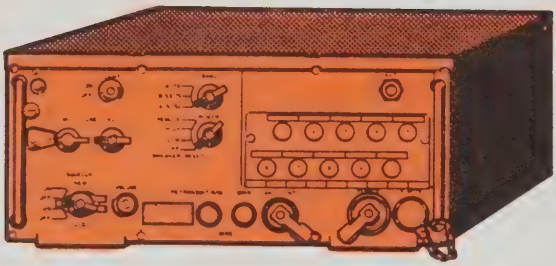

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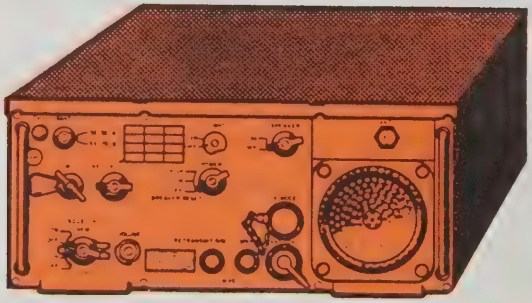

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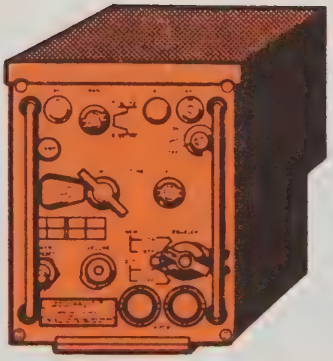

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Figure B-1

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER	(3) DESCRIPTION (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
		5820-00-223-7412	RADIO SET AN/VRC-12						
B-1	1	5820-00-892-0623	RECEIVER-TRANSMITTER, RADIO RT-246/VRC OR RT-246A/VRC	(80063)			1		
B-1	3	5820-00-892-0624	RECEIVER-RADIO R-442/VRC OR R-442A/VRC	(80063)			1		
B-1	4	5985-00-935-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7415	RADIO SET AN/VRC-43						
B-1	1	5920-00-892-0623	RECEIVER-TRANSMITTER, RADIO RT-246/VRC OR RT-246A/VRC	(80063)			1		
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7417	RADIO SET AN/VRC-44						
B-1	1	5820-00-592-0623	RECEIVER-TRANSMITTER, RADIO RT-246/VRC OR RT-246A/VRC	(80063)			1		
B-1	3	5820-00-892-0624	RECEIVER, RADIO R-442/VRC OR R-442A/VRC	(80063)			2		
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7418	RADIO SET AN/VRC-45						
B-1	1	5820-00-892-0623	RECEIVER-TRANSMITTER, RADIO RT-246/VRC OR RT-246A/VRC	(80063)			2		

SECTION II INTEGRAL COMPONENTS OF END ITEM

(1) ILLUSTRATION (A) FIG NO.	(1) ILLUSTRATION (B) ITEM NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION PART NUMBER	(3) DESCRIPTION (FSCM)	(4) LOCATION	(5) USABLE ON CODE	(6) QTY REQD	(7) QUANTITY RCVD	(7) QUANTITY DATE
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			2		
		5820-00-223-7433	RADIO SET AN/VRC-46						
B-1	2	5820-00-892-0622	RECEIVER-TRANSMITTER, RADIO RT-524/VRC OR RT-524A/VRC	(80063)			1		
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7434	RADIO SET AN/VRC-47						
B-1	2	5820-00-892-0622	RECEIVER-TRANSMITTER, RADIO RT-524/VRC OR RT-524A/VRC	(80063)			1		
B-1	3	5820-00-382-0624	RECEIVER, RADIO R-442/VRC OR R-442A/VRC	(80063)			1		
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7435	RADIO SET AN/VRC-48						
B-1	2	5820-00-892-0622	RECEIVER-TRANSMITTER, RADIO RT-524/VRC OR RT-524A/VRC	(80063)			1		
B-1	3	5820-00-892-0624	RECEIVER, RADIO R-442/VRC OR R-442A/VRC	(80063)			2		
B-1	4	5395-00-985-9024	ANTENNA AS-1729/VRC	(80063)			1		
		5820-00-223-7437	RADIO SET AN/VRC-49						
B-1	2	5820-00-892-0622	RECEIVER-TRANSMITTER, RADIO RT-524/VRC OR RT-524A/VRC	(80063)			2		
B-1	4	5985-00-985-9024	ANTENNA AS-1729/VRC	(80063)			2		

APPENDIX C

ADDITIONAL AUTHORIZATION LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists additional items you are authorized for support of the Radio Sets AN/VRC-12 and AN/VRC-43 through AN/VRC-49.

C-2. GENERAL

This list identifies items that do have to accompany the Radio Sets AN/VRC-12 and AN/VRC-43 through AN/VRC-49 and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

C-3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

SECTION II ADDITIONAL · AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M151, A1 & A2		
	AN/VRC-12:		
5820-00-450-6793	MK-1221/VRC-12 INSTALLATION KIT		1
	AN/VRC-43:		
5820-00-450-6792	MK-1220/VRC-43 INSTALLATION KIT		1
	AN/VRC-44:		
5820-00-469-6685	MK-1241/VRC-44 INSTALLATION KIT		1
	AN/VRC-46:		
5820-00-450-6804	MK-1234/GRC INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-193-8348	MK-1306/VRC-47 INSTALLATION KIT		1
	AN/VRC-48:		
5820-00-479-3034	MK-1225/VRC-48 INSTALLATION KIT		1
	AN/VRC-49:		
5820-00-450-6795	MK-1224/VRC-49 INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM / USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M151AC W/106MM RIFLE		
	AN/VRC-46:		
5820-00-450-6799	MK-1229/GRC INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-450-6798	MK-1228/VRC-47 INSTALLATION KIT		1
	RADIO SET USED IN M151, A1 W/XENON AN/GSS-14		
	AN/VRC-46:		
5820-00-351-3019	MK-1402/GRC INSTALLATION KIT		1
	RADIO SET USED IN M715		
	AN/VRC-12:		
5820-00-469-6683	MK-1239/VRC-12 INSTALLATION KIT		1
	AN/VRC-43:		
5820-00-450-6794	MK-1222/VRC-43 INSTALLATION KIT		1
	AN/VRC-46:		
5820-00-469-6687	MK-1243/GRC INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-450-6796	MK-1226/VRC-47 INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M715 - (CONTINUED)		
	AN/VRC-49:		
5820-00-450-6797	MK-1227/VRC-47 INSTALLATION KIT		1
	RADIO SET USED IN M715 W/AN/VRC-34/AN/GRC-87		
	AN/VRC-12:		
5820-00-469-0683	MK-1239/VRC-12 INSTALLATION KIT		1
	AN/VRC-12:		
5820-00-401-9709	MK-1476/GRC INSTALLATION-ACCESSORY KIT		1
	RADIO SET USED IN M561 (CAB)		
	AN/VRC-12:		
5820-00-469-6689	MK-1245/VRC-12 INSTALLATION KIT		1
	AN/VRC-12:		
5830-00-481-3695	MK-1255/VIC-1(V) INSTALLATION KIT		1
	AN/VRC-46:		
5820-00-493-7526	MK-1252/GRC INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-469-6689	MK-1245/VRC-47 INSTALLATION KIT		1
	AN/VRC-47:		
5830-00-481-3695	MK-1255/VIC-1(V) INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M561 OR M792 (AMBUL) (TRAILER)		
	AN/VRC-46:		
5820-00-469-6690	MK-1246/GRC INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-493-7530	MK-1253/VRC-47 INSTALLATION KIT		1
	AN/VRC-47:		
5830-00-481-3696	MK-1256/VIC-1(V) INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M561		
	AN/VRC-49:		
5820-00-493-7531	MK-1254/VRC-49 INSTALLATION KIT		1
	RADIO SET USED IN M34, M35, A1, A2, M135 & M211		
	AN/VRC-12:		
5820-00-469-6686	MK-1242/VRC-12 INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-459-8586	MK-1223/VRC-47 INSTALLATION KIT		1
	RADIO SET USED IN CAB OF M34, M35, A1, A2, M135 & M211		
	AN/VRC-46:		
5820-00-469-6688	MK-1244/VRC-46 INSTALLATION KIT		1
	RADIO SET USED IN TRUCK OF M34, M35, A1, A2, M135 & M211		
	AN/VRC-46:		
5820-00-469-6684	MK-1240/GRC INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM / USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M37, M37B1		
	AN/VRC-12:		
5820-00-469-6691	MK-1247/VRC-12 INSTALLATION KIT		1
	AN/VRC-46:		
5820-00-450-6802	MK-1232/GRC INSTALLATION KIT		1
	AN/VRC-49:		
5820-00-450-6800	NK-1230/VRC-49 INSTALLATION KIT		1
	RADIO SET USED IN M37, M37B		
	AN/VRC-43:		
5820-00-450-6801	MK-1231/VRC-43 INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-450-6803	MK-1247/VRC-47 INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SET USED IN M51, A1, A2		
	AN/VRC-46:		
5820-00-569-9570	MK-1738/GRC INSTALLATION SET		1
	RADIO SET USED IN M342A2		
	AN/VRC-46:		
5820-00-569-9570	MK-1738/GRC INSTALLATION KIT		1
	RADIO SET USED IN GENERAL PURPOSE INSTALLATION		
	AN/VRC-12:		
5820-00-401-9699	MK-1439/VRC-12 INSTALLATION KIT		1
	AN/VRC-43:		
5820-00-461-9666	MK-1446/VRC-43 INSTALLATION KIT		1
	AN/VRC-44:		
5820-00-401-9672	MK-1440/VRC-44 INSTALLATION KIT		1
	AN/VRC-45:		
5820-00-401-9668	MK-1444/VRC-45 INSTALLATION KIT		1

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	AN/VRC-46:		
5820-00-401-9669	MK-1443/VRC-46 INSTALLATION KIT		1
	AN/VRC-47:		
5820-00-401-9667	MK-1445/VRC-47 INSTALLATION KIT		1
	AN/VRC-48:		
5820-00-401-9670	MK-1442/VRC-48 INSTALLATION KIT		1
	AN/VRC-49:		
5820-00-401-9700	MK-1438/VRC-49 INSTALLATION KIT		1
	RADIO SETS USED IN M882/M892 SERIES		
	AN/VRC-12:		
5820-01-022-6293	MK-1814/VRC-12		1
	AN/VRC-43:		
5820-01-022-3332	MK-1811/VRC-43		1
	AN/VRC-46 (W/AN/VRC-64/160):		
5820-01-022-3328	MK-1817/GRC		

SECTION II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER AND FSCM USABLE ON CODE	(3) UNIT OF MEAS	(4) QTY AUTH
	RADIO SETS USED IN M882/M892 SERIES - (CONTINUED)		
	AN/VRC-46 (W/REMOTE IN DASH):		
5820-01-048-0761	MK-1869/GRC		1
	AN/VRC-47:		
5820-01-022-3333	MK-1810/VRC-47		1
	AN/VRC-47 (W/REMOTE IN DASH):		
5820-01-049-1018	MK-1870/VRC-47		1
	AN/VRC-49:		
5820-01-022-3330	MK-1813/VRC-49		1
	RADIO SETS USED IN M818/M819		
	AN/VRC-46:		
	MK-1910/VRC-46		1

APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

D-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the Radio Sets AN/VRC-12 and AN/VRC-43 through AN/VRC-49. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

D-2. EXPLANATION OF COLUMNS

a. Column 1 - Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use cleaning compound, item 5, App. D").

b. Column 2 - Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew

O - Organizational Maintenance/Aviation Unit Maintenance

F - Direct Support Maintenance/Aviation Intermediate Maintenance

H - General Support Maintenance

c. Column 3 - National Stock Number. This is the National stock number assigned to the item; use it to request or requistion the item.

d. Column 4 - Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply code for Manufacturer (FSCM) in parentheses followed by a part number.

e. Column 5 - Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition of the lowest unit of issue that will satisfy your requirements.

SECTION II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NO.	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION PART NO. AND FSCM		(5) UNIT OF MEAS
	C	5970-00-816-6056	HH-I-59581080	INSULATION TAPE, ELECTRICAL 81349	FT
		5970-00-419-4291	MIL-I-24391		
	C	6850-00-880-7616	MIL-S-8660	SILICONE COMPOUND 81349	OZ
	C	5905-00-293-4208		LOCKWIRE (SAFETY WIRE) 30889	EA
	C	6850-00-105-3084	MS180	CLEANING COMPOUND, FREON-TF 18589	OZ
	C	5330-00-905-6032	S91	O-RING 80063	EA

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		F03	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installatior antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2° without degradation of operation.

Item 5, Function column. Change "2 db" to "3db."

REASON: The adjustment procedure the the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.

Add new step f.1 to read, "Replace cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

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